SPECIAL PROVISIONS
&
SUPPLEMENTAL SPECIFICATIONS

CSI-Inch/Pound

Project No: **SP-9999(750)**

Name: **I-15& I-84 NEAR TREMONTON, SR-23 OVER BEAR RIVER**

BRIDGE PRESERVATION F-472, F-514, F-516 F-518 C-687

County: **CACHE**

Bid Opening: **May 03, 2005**

Date

2005 - U.S. Standard Units (Inch-Pound Units) March 14, 2005

Table of Contents

Project #SP-9999(750)

I. 2005 Standard Specifications

The State of Utah Standard Specifications for Road and Bridge Construction, U.S. Standard Units (Inch Pound Units), Edition of 2005 applies on this project as a static Specification Book as well as all other applicable specification changes.

Refer to Part XII (Special Provisions and Supplemental Specifications) for other project specific specifications.

II. List of Revised Standard Drawings

Change One

Revised February 24, 2005

AT 1	Legend Sheet	02/24/2005
AT 2	Ramp Meter Details	02/24/2005
AT 3	Ramp Meter Sign Panel	02/24/2005
AT 5	Ramp Meter Loop Installation	02/24/2005
AT 6	Conduit Details	02/24/2005
AT 7	Polymer-Concrete Junction Box Details	02/24/2005
AT 8	ATMS Cabinet	02/24/2005
AT 9	ATMS Cabinet Disconnect And Transformer Frame	02/24/2005
AT 10	CCTV Mounting Details	02/24/2005
AT 11	CCTV Pole Details	02/24/2005
AT 12	CCTV Pole Foundation For Dedicated CCTV Pole	02/24/2005
AT 13	Deleted	N/A
AT 14	Weigh In Motion Piezo Details	02/24/2005
AT 15	RWIS Site And Foundation Details	02/24/2005
AT 16	RWIS Tower Base And Service Pad Layout	02/24/2005
AT 17	Ground Rod Installation And Tower Grounding	02/24/2005
AT 18	TMS Detection Zone Layout	02/24/2005
BA 3	Deleted	N/A
BA 3A	Cast In Place Constant Slope Barrier	02/24/2005
BA 3B	Precast Concrete Constant Slope Transition Section For Crash Cushion And W-Beam Guardrail	02/24/2005
BA 4B	W-Beam Guardrail Transition	02/24/2005
BA 4C	W-Beam Guardrail Transition Curb Section	02/24/2005
CC 7	Deleted	N/A
CC 7A	Grading And Installation Details Crash Cushion Type F Quad Trend 350	02/24/2005
CC 7B	Reserved For Future Use	N/A
CC 8	Deleted	N/A
CC 8A	Grading And Installation Details Crash Cushion Type G	02/24/2005
CC 8B	Grading And Installation Details For “3R” Projects Crash Cushion Type G	02/24/2005
CC 9A	Grading And Installation Details Crash Cushion Type H	02/24/2005
CC 9B	Grading And Installation Details Crash Cushion Type H (Parabolic Flare)	02/24/2005
DD 4	Geometric Design for Freeways (Roadway)	02/24/2005
FG 3	Swing Gates Type I For Gates Less Than 17’	02/24/2005
ST 5	Painted Median And Auxiliary Lane Details	02/24/2005

III. Materials Minimum Sampling and Testing

Follow the requirements of the Current Materials Minimum Sampling and Testing Manual:

Materials Minimum Sampling and Testing Manual reference can be found from the UDOT Web Site at:
http://www.udot.utah.gov/index.php/m=c/tid=645

IV. Notice to Contractors

NOTICE TO CONTRACTORS

Sealed proposals will be received by the Utah Department of Transportation UDOT/DPS Building (4th Floor), 4501 South 2700 West, Salt Lake City, Utah. 84114-8220, until 2 o'clock p.m. Tuesday, May 03, 2005, and at that time the download process of bids from the USERTrust Vault to UDOT will begin, with the public opening of bids scheduled at 2:30 for BRIDGE PRESERVATION F-472, F-514, F-516 F-518 C-687 of I-15& I-84 NEAR TREMONTON, SR-23 OVER BEAR RIVER in CACHE County, the same being identified as State Project No: SP-9999(750).

Federal Regulations:
Wage Rate Non-Applicable.

Project Location: I-15& I-84 NEAR TREMONTON, SR-23 OVER BEAR RIVER

The principal items of work are as follows (for all items of work see attachment):
Polymer Overlay, Type 1
Traffic Control
Mobilization

The project is to be completed: in 30 Calendar Days.

Other Requirements:
All project bidding information, including Specifications and Plans, can be viewed, downloaded, and printed from UDOT's Project Development Construction Bid Opening Information website, http://www.udot.utah.gov/index.php/m=c/tid=319. To bid on UDOT projects, bidders must use UDOT's Electronic Bid System (EBS). The EBS software and EBS training schedules are also available on this website.

Project information can also be reviewed at the main office in Salt Lake City, its Region offices, and its District offices in Price, Richfield, and Cedar City.

Project Plans cannot be downloaded or printed from the website unless your company is registered with UDOT. Go to UDOT's website to register. Unregistered companies may obtain a **CD**, that contains the Specifications and Plans, from the main office, 4501 South 2700 West, Salt Lake City, (801) 965-4346, for a fee of $20.00, plus tax and mail charge, if applicable, none of which will be refunded.

As required, a contractor's license must be obtained from the Utah Department of Commerce.

Each bidder must submit an electronic bid bond from an approved surety company using UDOT's Electronic Bid System (EBS); or in lieu thereof, cash, certified check, or cashier's check for not less than 5% of the total amount of the bid, made payable to the Utah Department of Transportation, showing evidence of good faith and a guarantee that if awarded the contract, the bidder will execute the contract and furnish the contract bonds as required.

The right to reject any or all bids is reserved.

If you need an accommodation under the Americans with Disabilities Act, contact the Construction Division at (801) 965-4346. Please allow three working days.

Additional information may be secured at the office of the Utah Department of Transportation, (801) 965-4346.

Dated this 16th day of April, 2005.

UTAH DEPARTMENT OF TRANSPORTATION
John R. Njord, Director

Revised Date:

V. Bidding Schedule

Utah Department of Transportation
Bidder's Schedule

Bid Opening Date: 5/3/2005
Region: REGION 1
Project Number: SP-9999(750)
County: CACHE
Project Name: I-15& I-84 NEAR TREMONTON, SR-23 OVER BEAR RIVER
Concept: BRIDGE PRESERVATION F-472, F-514, F-516 F-518 C-687
Funding: STATE
Bid Items Version#: 1

#	Item	Description	Quantity	Unit
20 - STRUCTURES				
1	01285001P	Mobilization	1	lump sum
2	013150010	Public Information Services	1	lump sum
3	015540005	Traffic Control	1	lump sum
4	02721007P	Untreated Base Course 3/4" or 1" max (contingent item)	100	ton
5	02741001*	Hot Mix Asphalt - Leveling Pad	95	ton
6	02768005*	4 inch Pavement Marking Tape - White	2500	foot
7	02768015*	4 inch Pavement Marking Tape - Yellow	1270	foot
8	028410030	W-Beam Guardrail Transition Element	2	each
9	028430035	Crash Cushion Type G	2	each
10	02844001*	Precast Concrete Barrier (State Furnished)	600	foot
11	03371000*	Polymer Overlay, Type 1	71000	square foot
12	03381001*	Clear Penetrating Concrete Sealer for Bridges	3535	foot
13	03611000*	Slab Jacking (Polyurethane Method)	3000	pound
14	039330020	Parapet End Modification	4	each
15	03934001*	Structure Pothole Patching, Quick Set	1000	square foot

Note: Item numbers ending with "" or "P" identify a change to the Standard Specification, Supplemental Specifications or Measurement and payment. Read all related documents carefully.

VI. Measurement and Payment

Measurement and Payment
SP-9999(750)

The Department will measure and pay for each bid item as detailed in this section. Payment is contingent upon acceptance by the Department.

Items are listed by Specification and in tables as follows:

Item #	**Bid Item Number**	**Bid Item Name**	**Unit of Measurement and Payment**
Additional information goes here.			

1.	**01285001P**	**Mobilization**	**Lump sum**
A.		Include necessary survey for barrier	
B.	**Payment**	**Amount Paid**	**When Paid**
	First	The lesser of 25% of Mobilization or 2.5% of contract	With first estimate
	Second	The lesser of 25% of Mobilization or 2.5% of contract	With estimate following completion of 5% of contract
	Third	The lesser of 25% of Mobilization or 2.5% of contract	With estimate following completion of 10% of contract
	Fourth	The lesser of 25% of Mobilization or 2.5% of contract	With estimate following completion of 20% of contract
	Final	Amount bid in excess of 10% of contract price.	Project Acceptance-Final

2.	**013150010**	**Public Information Services**	**Lump Sum**
	Payment	**Amount Paid**	**When Paid**
	First	25% of the bid item amount	With first estimate
	Second	Remaining portion of bid item paid as a percentage of the contract completed	With each estimate

3.	015540005	Traffic Control	Lump Sum
	Payment	**Amount Paid**	**When Paid**
	First	25% of the bid item amount	With first estimate
	Second	Remaining portion of bid item paid as a percentage of the contract completed	With each estimate

4.	02721007P	Untreated Base Course ¾" or 1" max (contingent Item	Ton
In place.			

5.	02741001*	Hot Mix Asphalt – Leveling Pad	Ton
In place. Includes excavation, pavement sawing, asphalt pavement removal, asphalt cement, prime coat and tack coat and all other additives required for approved mix.			

6.	02768005*	4 inch Pavement Marking Tape – White	Foot
A. Do not measure the gap in the broken line. B. Include all costs for the Manufacturer's Service Representative and other technical assistance in the contract unit price.			

7.	02768015*	4 inch Pavement Marking Tape – Yellow	Foot
A. Do not measure the gap in the broken line. B. Include all costs for the Manufacturer's Service Representative and other technical assistance in the contract unit price.			

8.	028410030	W-Beam Guardrail Transition Element	Each
In place, includes guardrail with posts, blocks, hardware, curb section, and barrier reflectors. Use same post type as designated in project typical installation.			

9.	028430035	Crash Cushion Type G	Each
In place, includes all Crash Cushion Markings – Marker Posts and Plates, Object Markers, and all mounting hardware.			

10.	02844001*	Pre-Cast Concrete Barrier (State Furnished)	Foot
In place. A. Include transporting, placing, and all hardware and equipment necessary. B. Include connection pins, reflectors, stabilization pins and barrier seal.			

11.	**03371000***	**Polymer Overlay (Type 1)**	**Square Foot**
The price will be full compensation for all work including, but not limited to, striping removal, minor shallow pothole patching, shot blasting, polymer overlay and aggregate.			

12.	**03381001***	**Clear Penetrating Concrete Sealer for Bridges**	**Foot**
In place. Along traffic face and top of bridge parapet.			

13.	**03611000***	**Slab Jacking (Polyurethane Method)**	**Pound**

14.	**039330020**	**Parapet End Modification**	**Each**

15.	**03934001***	**Structure Pothole Patching, Quick Set**	**Square Foot**
Estimated plan quantities are based on preliminary field review for bidding purposes only. Repair the actual quantities determined by the Engineer. Pothole patching may be reduced, deleted, or increased over the bid quantities from the contract. If any of these situations occur, the price of the actual quantity will be paid for at the contract unit price. Department will not allow additional compensation for repairing blow throughs, or for removing and repairing failed patches.			

Summary Report

Project: SP-9999(750) **Version: 1**

I-15& I-84 NEAR TREMONTON, SR-23 OVER BEAR RIVER

Detail	Alt Group	Alt #	Description
20 - STRUCTURES	0	0	

Item Number	Description	Qty	Unit
01285001P	Mobilization	1	Lump
013150010	Public Information Services	1	Lump
015540005	Traffic Control	1	Lump
02721007P	Untreated Base Course 3/4" or 1" max (contingent item)	100	Ton
02741001*	Hot Mix Asphalt - Leveling Pad	95	Ton
02768005*	4 inch Pavement Marking Tape - White	2,500	ft
02768015*	4 inch Pavement Marking Tape - Yellow	1,270	ft
028410030	W-Beam Guardrail Transition Element	2	Each
028430035	Crash Cushion Type G	2	Each
02844001*	Precast Concrete Barrier (State Furnished)	600	ft
03371000*	Polymer Overlay, Type 1	71,000	sq ft
03381001*	Clear Penetrating Concrete Sealer for Bridges	3,535	ft
03611000*	Slab Jacking (Polyurethane Method)	1,000	lb
039330020	Parapet End Modification	4	Each
03934001*	Structure Pothole Patching, Quick Set	950	sq ft

Detailed Report

SP-9999(750) **Version: 1**

I-15& I-84 NEAR TREMONTON, SR-23 OVER BEAR RIVER

20 - STRUCTURES **Alt Group: 0** **Alt #: 0**

Item Number	Description	Use Qty	Unit

02721007P **Untreated Base Course 3/4" or 1" max (contingent item)** 100 Ton

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
0F-687					100.0	Under leveling pad for barrier as needed
					100.0	

Note #	Note
1	After excavation if existing base gradation is adequate do not use.

02741001* **Hot Mix Asphalt - Leveling Pad** 95 Ton

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
C-687					90.0	Both approaches under barrier - refer to plans
EROSION					5.0	At parapet ends
					95.0	

Note #	Note
1	Fill existing erosion at parapet ends with HMA.

02768005* **4 inch Pavement Marking Tape - White** 2,500 ft

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
C-687					555.0	
F-514 NB					210.0	
F-514 SB					210.0	
F-516 NB					340.0	
F-516 SB					340.0	
F-518 NB					220.0	
F-518 SB					205.0	
					2,080.0	

02768015* **4 inch Pavement Marking Tape - Yellow** 1,270 ft

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
F-514 NB					170.0	
F-514 SB					170.0	
F-516 NB					275.0	
F-516 SB					275.0	
F-518 NB					175.0	
F-518 SB					165.0	
					1,230.0	

20 - STRUCTURES **Alt Group: 0** **Alt #: 0**

Item Number	Description	Use Qty	Unit
028410030	**W-Beam Guardrail Transition Element**	2	Each

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
C-687					2.0	Use with Crash Cushion Type G
					2.0	

028430035	**Crash Cushion Type G**	2	Each

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
C-687					2.0	On approach ends of concrete barrier
					2.0	

02844001*	**Precast Concrete Barrier (State Furnished)**	600	ft

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
C-687					600.0	Both ends of structure, 200 ft. approach & 100 ft. trailing
					600.0	

03371000*	**Polymer Overlay, Type 1**	71,000	sq ft

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
C-687					9,080.0	SR-23
F-472					9,000.0	County Road near UDOT Bothwell Shed over I-84
F-514 NB					8,790.0	I-15
F-514 SB					6,790.0	I-15
F-516 NB					11,100.0	I-15
F-516 SB					11,100.0	I-15
F-518 NB					7,100.0	I-15
F-518 SB					6,655.0	I-15
SR-102	OVER I-84				1,000.0	REPAIR EXISTING POLYMER OVERLAY
					70,615.0	

Detailed Report

SP-9999(750) **Version: 1**

I-15& I-84 NEAR TREMONTON, SR-23 OVER BEAR RIVER

20 - STRUCTURES **Alt Group: 0** **Alt #: 0**

Item Number	Description	Use Qty	Unit
03381001*	**Clear Penetrating Concrete Sealer for Bridges**	3,535	ft

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
C-687					495.0	
F-472					600.0	
F-514 NB					335.0	
F-514 SB					335.0	
F-516 NB					545.0	
F-516 SB					545.0	
F-518 NB					350.0	
F-518 SB					330.0	
					3,535.0	

03611000*	**Slab Jacking (Polyurethane Method)**	1,000	lb

Note #	Note
1	Raise minor settlement of approach slabs. Locations as directed by the Engineer.

039330020	**Parapet End Modification**	4	Each

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
C-687					4.0	
					4.0	

03934001*	**Structure Pothole Patching, Quick Set**	950	sq ft

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
C-487					40.0	County Road over I-84
C-687					900.0	SR-23, Structure C-687
MISC.					10.0	
					950.0	

Measurement and Payment
SP-9999(750)

The Department will measure and pay for each bid item as detailed in this section. Payment is contingent upon acceptance by the Department.

Items are listed by Specification and in tables as follows:

Item #	**Bid Item Number**	**Bid Item Name**	**Unit of Measurement and Payment**
Additional information goes here.			

1.	**01285001P**	**Mobilization**	**Lump sum**
A.		Include necessary survey for barrier	
B.	**Payment**	**Amount Paid**	**When Paid**
	First	The lesser of 25% of Mobilization or 2.5% of contract	With first estimate
	Second	The lesser of 25% of Mobilization or 2.5% of contract	With estimate following completion of 5% of contract
	Third	The lesser of 25% of Mobilization or 2.5% of contract	With estimate following completion of 10% of contract
	Fourth	The lesser of 25% of Mobilization or 2.5% of contract	With estimate following completion of 20% of contract
	Final	Amount bid in excess of 10% of contract price.	Project Acceptance-Final

2.	**013150010**	**Public Information Services**	**Lump Sum**
	Payment	**Amount Paid**	**When Paid**
	First	25% of the bid item amount	With first estimate
	Second	Remaining portion of bid item paid as a percentage of the contract completed	With each estimate

3.	015540005	Traffic Control	Lump Sum
	Payment	**Amount Paid**	**When Paid**
	First	25% of the bid item amount	With first estimate
	Second	Remaining portion of bid item paid as a percentage of the contract completed	With each estimate

4.	023160020	Roadway Excavation (Plan Quantity)	Cubic yard

5.	02721007P	Untreated Base Course ¾" or 1" max (contingent Item	Ton
In place.			

6.	02741001*	Hot Mix Asphalt – Leveling Pad	Ton
In place. Includes excavation and pavement sawing.			

7.	027680005	4 inch Pavement Marking Tape – White	Feet
A. Do not measure the gap in the broken line. B. Include all costs for the Manufacturer's Service Representative and other technical assistance in the contract unit price.			

8.	027680015	4 inch Pavement Marking Tape – Yellow	Feet
A. Do not measure the gap in the broken line. B. Include all costs for the Manufacturer's Service Representative and other technical assistance in the contract unit price.			

9.	028410030	W-Beam Guardrail Transition Element	Each
In place, includes guardrail with posts, blocks, hardware, curb section, and barrier reflectors. Use same post type as designated in project typical installation.			

10.	028430035	Crash Cushion Type G	Each
In place, includes all Crash Cushion Markings – Marker Posts and Plates, Object Markers, and all mounting hardware.			

11.	02844001*	Pre-Cast Concrete Barrier (State Furnished)	Feet
In place. A. Include transporting, placing, and all hardware and equipment necessary. B. Include connection pins, reflectors, stabilization pins and barrier seal.			

12.	**03371000***	**Polymer Overlay (Type 1)**	**Square feet**
The price will be full compensation for all work including, but not limited to, striping removal, minor pothole patching, shot blasting, apply polymer overlay and aggregate.			

13.	**03381001***	**Clear Penetrating Concrete Sealer for Bridges**	**Feet**
In place. Along traffic face and top of bridge parapet.			

14.	**03611000***	**Slab Jacking (Polyurethane Method)**	**Pound**

15.	**039330020**	**Parapet End Modification**	**Each**

16.	**03934001***	**Structure Pothole Patching, Quick Set**	**Square feet**
Estimated plan quantities are based on preliminary field review for bidding purposes only. Repair the actual quantities determined by the Engineer. Pothole patching may be reduced, deleted, or increased over the bid quantities from the contract. If any of these situations occur, the price of the actual quantity will be paid for at the contract unit price. Department will not allow additional compensation for repairing blow throughs, or for removing and repairing failed patches.			

VII. PDBS Project Summary Report and Detailed Stationing Summaries Report

Summary Report

Project: SP-9999(750) **Version: 1**

I-15& I-84 NEAR TREMONTON, SR-23 OVER BEAR RIVER

Detail	Alt Group	Alt #	Description
20 - STRUCTURES	0	0	

Item Number	Description	Qty	Unit
01285001P	Mobilization	1	Lump
013150010	Public Information Services	1	Lump
015540005	Traffic Control	1	Lump
02721007P	Untreated Base Course 3/4" or 1" max (contingent item)	100	Ton
02741001*	Hot Mix Asphalt - Leveling Pad	95	Ton
02768005*	4 inch Pavement Marking Tape - White	2,500	ft
02768015*	4 inch Pavement Marking Tape - Yellow	1,270	ft
028410030	W-Beam Guardrail Transition Element	2	Each
028430035	Crash Cushion Type G	2	Each
02844001*	Precast Concrete Barrier (State Furnished)	600	ft
03371000*	Polymer Overlay, Type 1	71,000	sq ft
03381001*	Clear Penetrating Concrete Sealer for Bridges	3,535	ft
03611000*	Slab Jacking (Polyurethane Method)	3,000	lb
039330020	Parapet End Modification	4	Each
03934001*	Structure Pothole Patching, Quick Set	1,000	sq ft

Detailed Report

SP-9999(750) **Version: 1**

I-15& I-84 NEAR TREMONTON, SR-23 OVER BEAR RIVER

20 - STRUCTURES **Alt Group: 0** **Alt #: 0**

Item Number	Description	Use Qty	Unit

02721007P **Untreated Base Course 3/4" or 1" max (contingent item)** 100 Ton

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
0F-687					100.0	Under leveling pad for barrier as needed
					100.0	

Note #	Note
1	After excavation if existing base gradation is adequate do not use.

02741001* **Hot Mix Asphalt - Leveling Pad** 95 Ton

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
C-687					90.0	Both approaches under barrier - refer to plans
EROSION					5.0	At parapet ends
					95.0	

Note #	Note
1	Fill existing erosion at parapet ends with HMA.

02768005* **4 inch Pavement Marking Tape - White** 2,500 ft

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
C-687					555.0	
F-514 NB					210.0	
F-514 SB					210.0	
F-516 NB					340.0	
F-516 SB					340.0	
F-518 NB					220.0	
F-518 SB					205.0	
					2,080.0	

02768015* **4 inch Pavement Marking Tape - Yellow** 1,270 ft

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
F-514 NB					170.0	
F-514 SB					170.0	
F-516 NB					275.0	
F-516 SB					275.0	
F-518 NB					175.0	
F-518 SB					165.0	
					1,230.0	

20 - STRUCTURES **Alt Group: 0** **Alt #: 0**

Item Number	Description	Use Qty	Unit
028410030	**W-Beam Guardrail Transition Element**	2	Each

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
C-687					2.0	Use with Crash Cushion Type G
					2.0	

028430035	**Crash Cushion Type G**	2	Each

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
C-687					2.0	On approach ends of concrete barrier
					2.0	

02844001*	**Precast Concrete Barrier (State Furnished)**	600	ft

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
C-687					600.0	Both ends of structure, 200 ft. approach & 100 ft. trailing
					600.0	

03371000*	**Polymer Overlay, Type 1**	71,000	sq ft

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
C-687					9,080.0	SR-23
F-472					9,000.0	County Road near UDOT Bothwell Shed over I-84
F-514 NB					8,790.0	I-15
F-514 SB					6,790.0	I-15
F-516 NB					11,100.0	I-15
F-516 SB					11,100.0	I-15
F-518 NB					7,100.0	I-15
F-518 SB					6,655.0	I-15
SR-102	OVER I-84				1,000.0	REPAIR EXISTING POLYMER OVERLAY
					70,615.0	

20 - STRUCTURES **Alt Group: 0** **Alt #: 0**

Item Number	Description	Use Qty	Unit
03381001*	**Clear Penetrating Concrete Sealer for Bridges**	3,535	ft

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
C-687					495.0	
F-472					600.0	
F-514 NB					335.0	
F-514 SB					335.0	
F-516 NB					545.0	
F-516 SB					545.0	
F-518 NB					350.0	
F-518 SB					330.0	
					3,535.0	

03611000*	**Slab Jacking (Polyurethane Method)**	3,000	lb

Note #	Note
1	Raise minor settlement of approach slabs. Locations as directed by the Engineer.

039330020	**Parapet End Modification**	4	Each

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
C-687					4.0	
					4.0	

03934001*	**Structure Pothole Patching, Quick Set**	1,000	sq ft

Line/Sheet	From Station	From Offset	To Station	To Offset	Qty	Comment
C-487					40.0	County Road over I-84
C-687					900.0	SR-23, Structure C-687
MISC.					50.0	
					990.0	

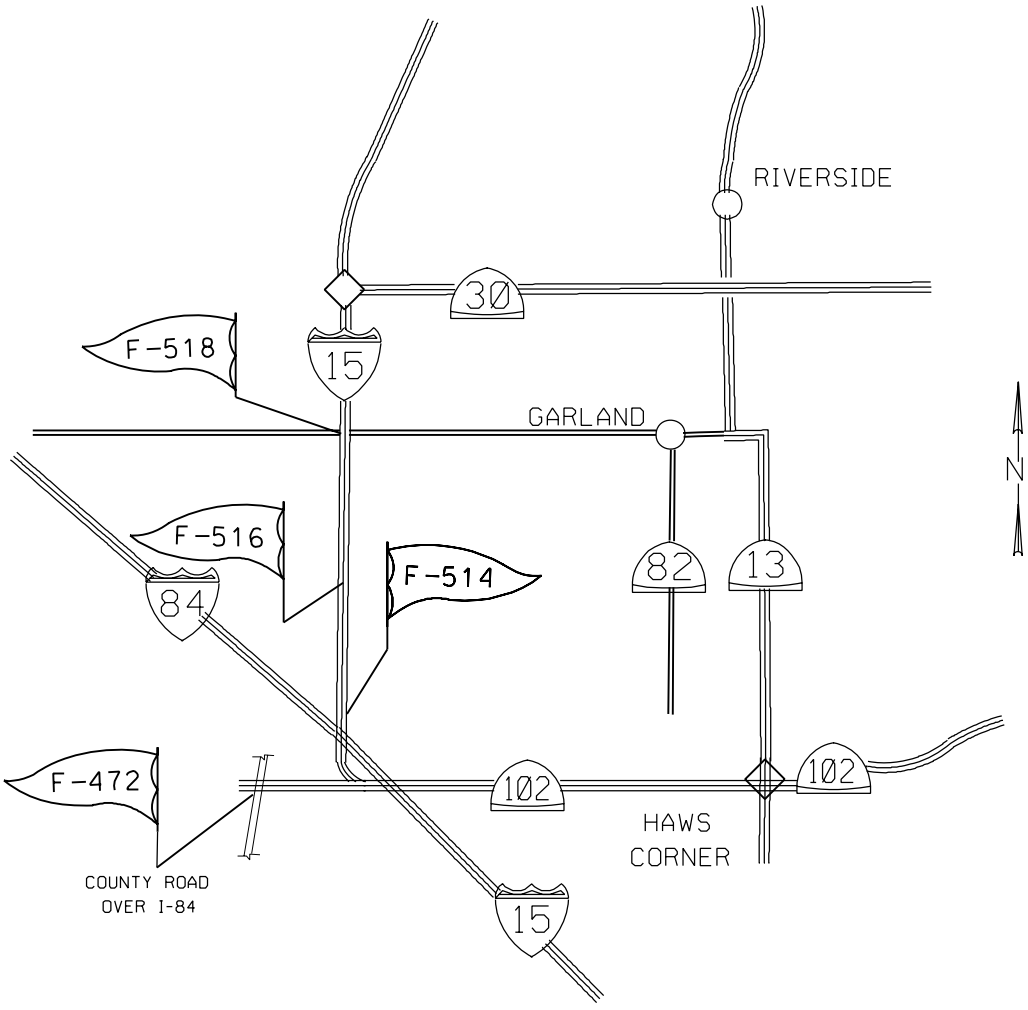
VIII. Location Map

LOCATION MAP

SP-9999(750)

BRIDGE PRESERVATION F-514, F-516, F-518, F-472

I-15 NEAR TREMONTON, SR-23 OVER BEAR RIVER

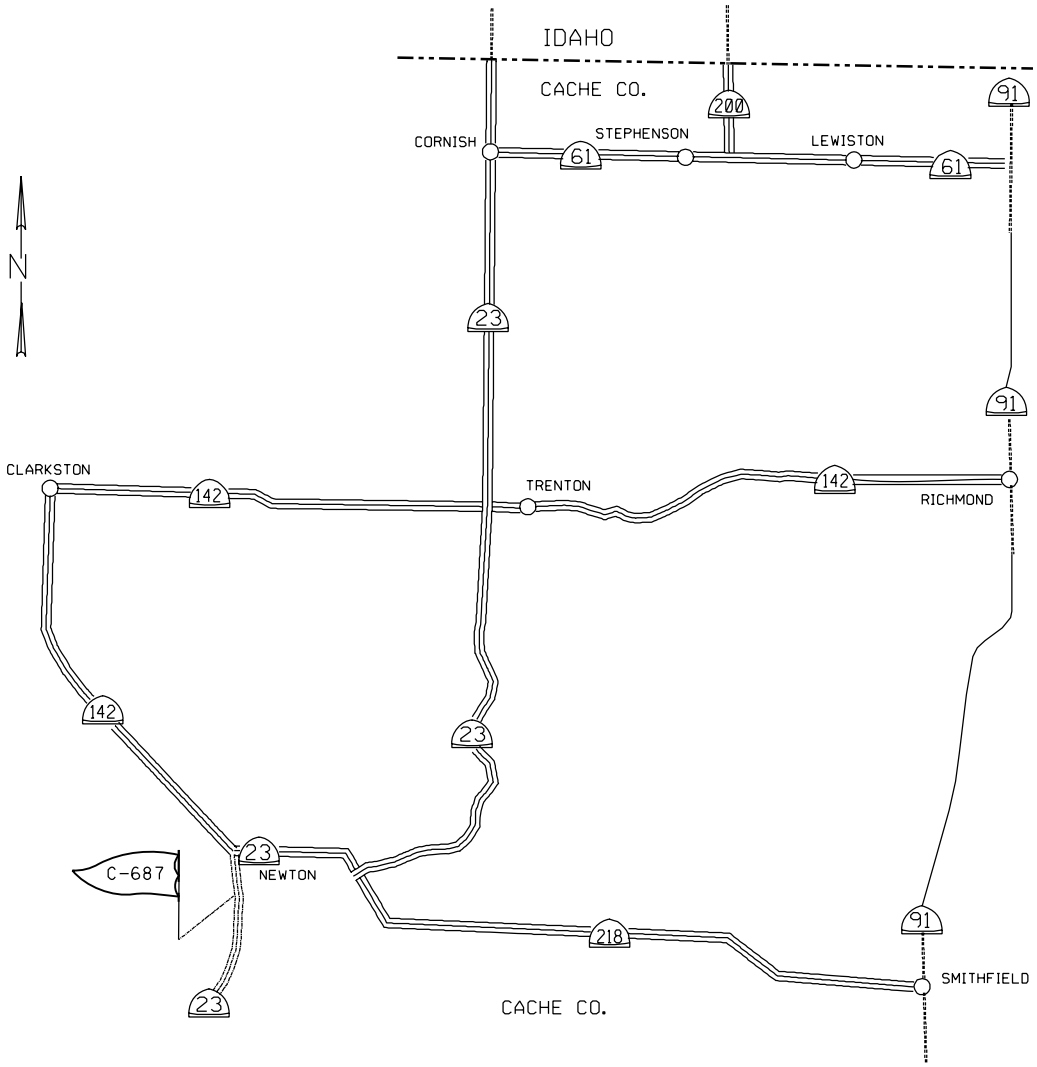


Location Map

SP-9999(750)

Bridge Preservation C-687

I-15 Near Tremonton, SR-23 Over Bear River



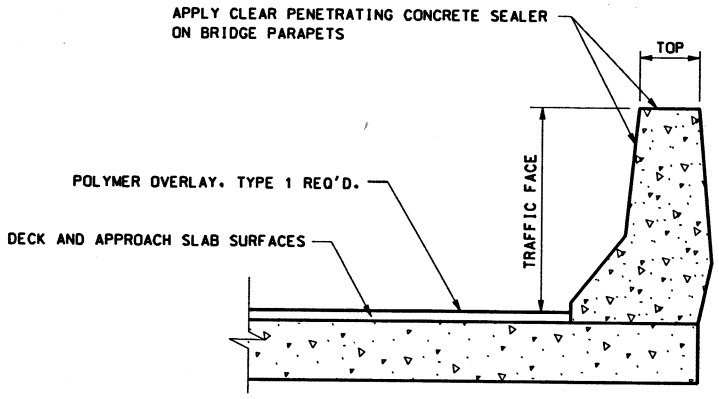
IX. Typical Sections or Detail Sheets

PROJECT No. SP-9999 (750)

POLYMER OVERLAY AND CONCRETE SEALER

STRUCTURES

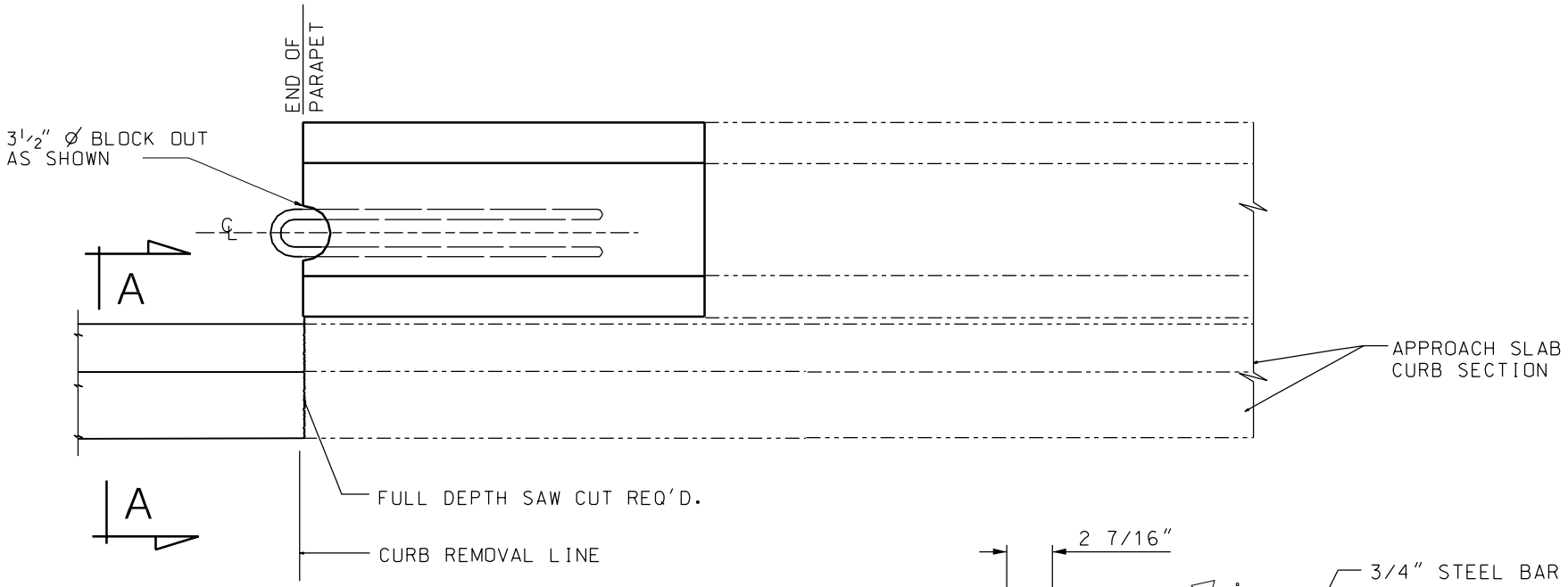
1F-514, WEST OF TREMONTON, I-15, M.P. 382.78
3F-514, WEST OF TREMONTON, I-15, M.P. 382.78
1F-516, GARLAND INTERCHANGE, I-15, M.P. 383.81
3F-516, GARLAND INTERCHANGE, I-15, M.P. 383.81
1F-518, 2 MILES NORTH OF GARLAND INTERCHANGE, I-15, M.P. 385.97
3F-518, 2 MILES NORTH OF GARLAND INTERCHANGE, I-15, M.P. 385.97
0C-687, 1 MILE SOUTH OF NEWTON, SR-23, M.P. 16.68
0F-472, COUNTY ROAD OVER I-84, APPROXIMATELY 3 MILES WEST OF TREMONTON (AT UDOT BOTHWELL MAINENANCE STATION)



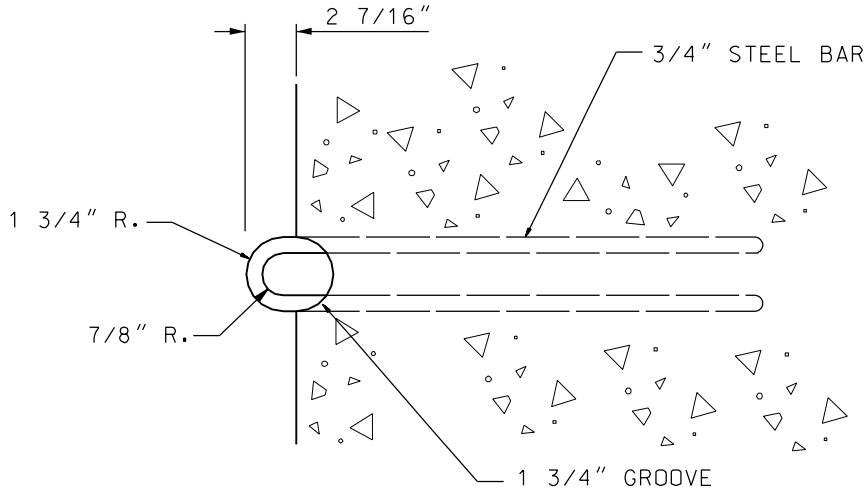
NOTE: SEE DRAWINGS FOR PARAPET DIMENSIONS

NOTES:

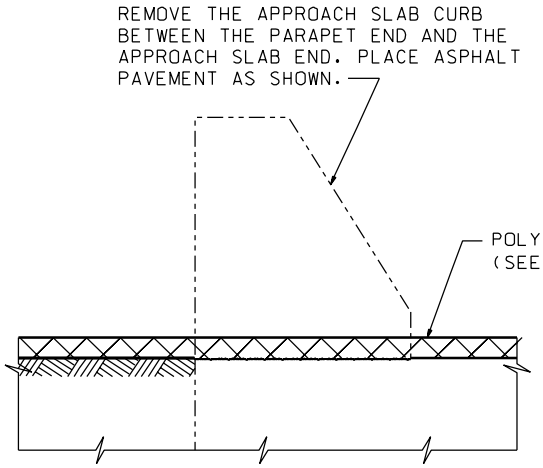
1. APPLY POLYMER OVERLAY TO ENTIRE DECK AND APPROACH SLAB SURFACES.
2. APPLY CLEAR PENETRATING CONCRETE SEALER TO TRAFFIC FACE AND TOP OF PARAPET.
3. REPAIR PARTIAL DEPTH POTHOLES IN DECK AND APPROACH SLAB SURFACES WITH POLYMER MATERIAL UP TO 1" DEPTH. THE REPAIR WORK SHOULD BE INCLUDED IN THE COST OF POLYMER OVERLAY



PLAN



CONNECTION BAR END DETAIL



TYPICAL END SECTION

SECTION A-A

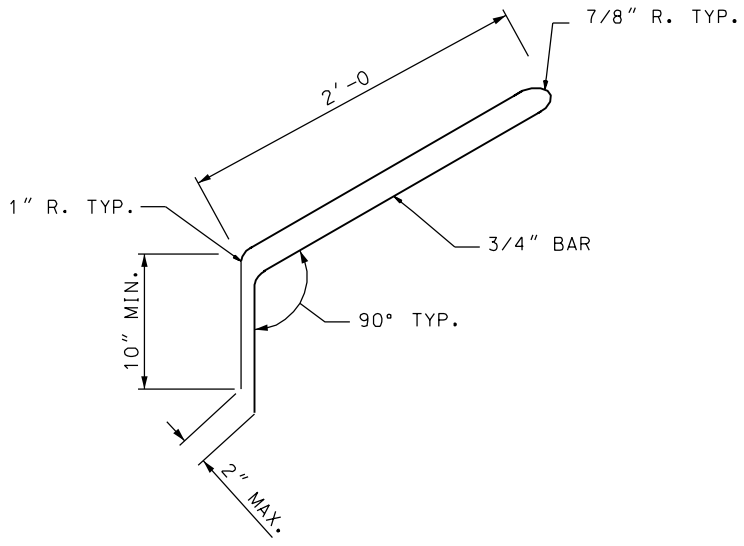
NOTES:

1.- RETAIN ALL EXISTING HORIZONTAL AND VERTICAL BARS IN PARAPET.

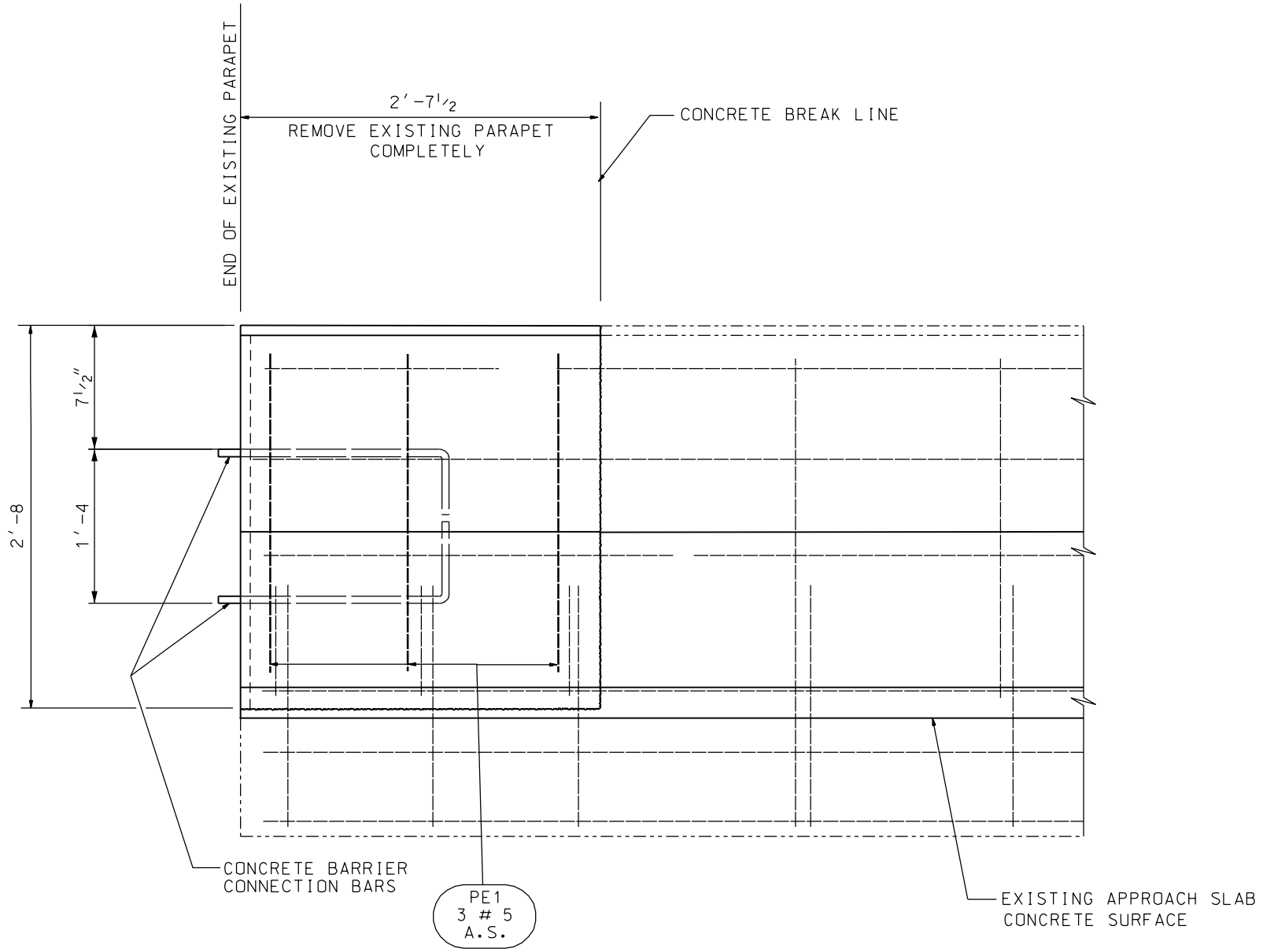
2.- FURNISH CONNECTION LOOP BARS AT ALL FOUR CORNERS OF STRUCTURE.

3.- RECAST THE ENDS OF EACH PARAPET AFTER INSTALLATION OF CONNECTION LOOP BARS AND THE ADDITIONAL REBARS.

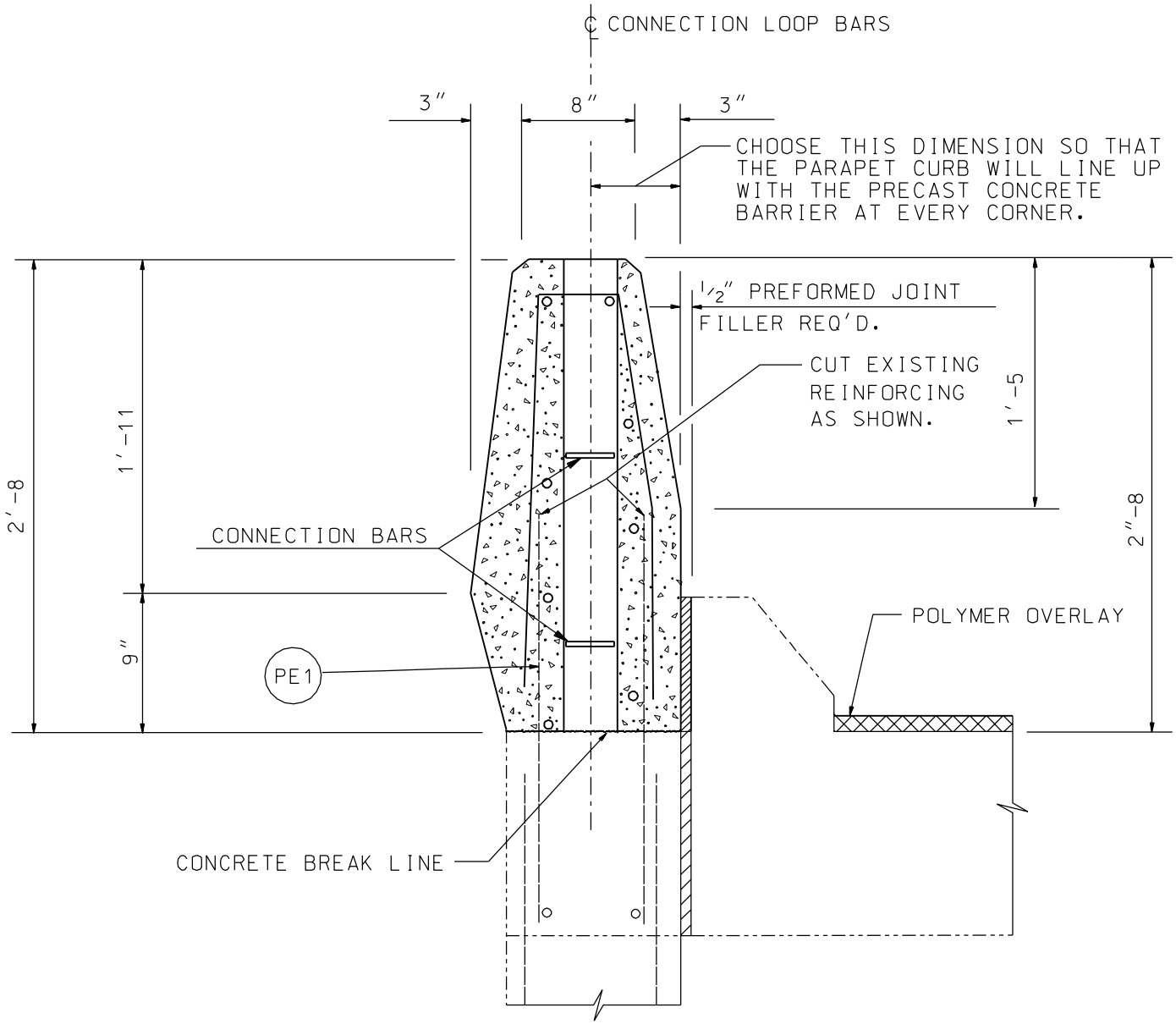
4.- IF GUARDRQAIL CONNECTION IS NEEDED CONNECT USING STANDARD DRAWING BA 4B & 4C.



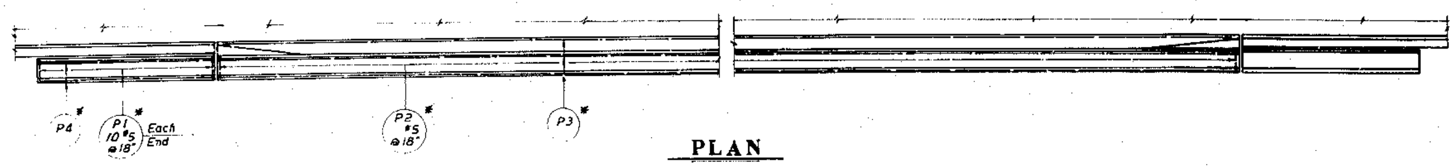
CONNECTION LOOP DETAIL



PARAPET END DETAIL

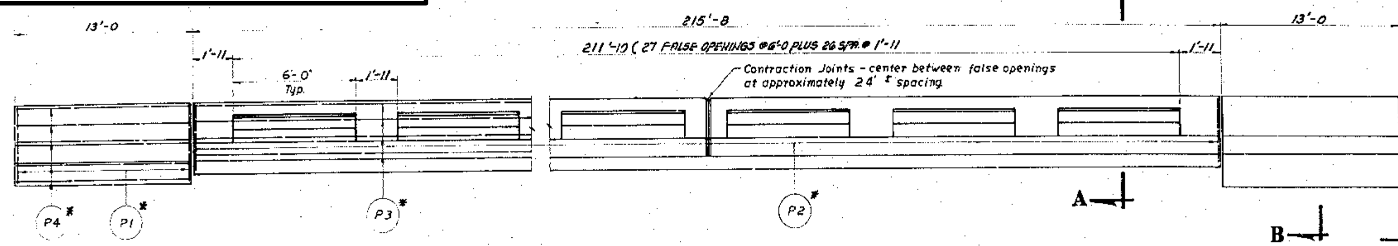


TYPICAL END SECTION



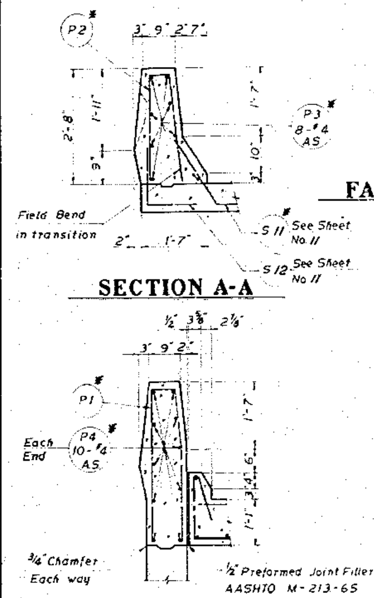
PLAN

FOR INFORMATION ONLY



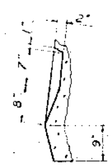
ELEVATION

All dimensions shown are along edge of deck



SECTION A-A

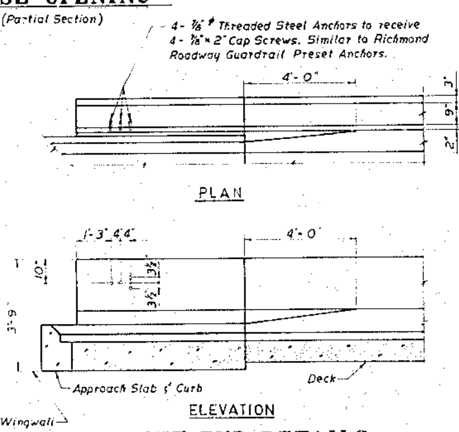
SECTION B-B



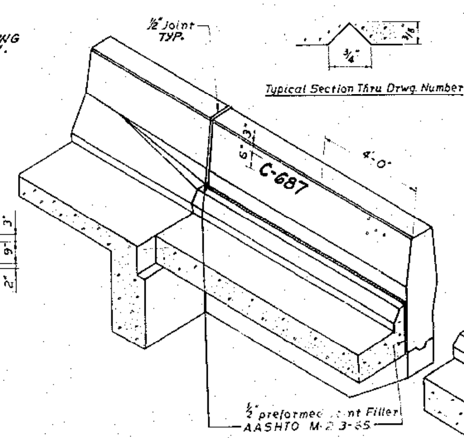
FALSE OPENING

(Partial Section)

NOTE:
* THIS DESIGNATES EPOXY COATED REINFORCING STEEL AS FOUND IN THE SPECIAL PROVISION.



PARAPET END DETAILS

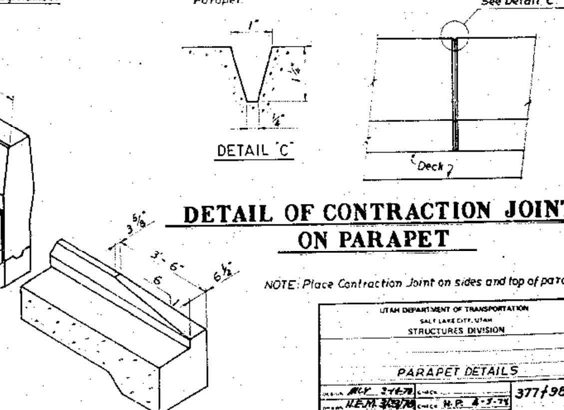


ISOMETRIC

Concrete Quantities for all parapets
54.3 Cu. Yds. class AA (AE)

GENERAL NOTES

1.- All longitudinal bars are shown in reinforcing schedule with subscripts which refer to the parapet section where they are located. (See Key Plan)
2.- Cover to reinforcing steel shall be 1 1/2" min. unless noted otherwise.
3.- Payment for 7/8" ϕ Threaded Steel inserts and Preformed Joint Filler, AASHTO M-213-65, shall be included in contract price for Class AA Concrete (AE).
4.- Drawing Number to be located on right-hand side of approach Parapet.



DETAIL OF CONTRACTION JOINT ON PARAPET

NOTE: Place Contraction Joint on sides and top of parapet

NO	BY	DATE	REMARKS

REVISIONS

UTAH DEPARTMENT OF TRANSPORTATION
SALT LAKE CITY, UTAH
STRUCTURES DIVISION

PARAPET DETAILS

DESIGN MCY 2-16-78	CHECK	377+98.40
DRAWN H.E.M. 3/29/78	CHECK H.P. 4-3-78	
TRACED H.E.M. 4/3/78	CHECK H.P. 4-5-78	STATION
6-2-78		CACHE COUNTY
APPROVED 8-27-78		DRG. NO. C-687
TQS-BRS-0531(2) PROJECT NUMBER		SHT 12 OF 13

07-APR-2005 DGN File: N:\PROJECTS\4826_05\Sheet_Files\Structures\4826_C687-02-FOR INFOR ONLY.DGN

X. Standard Drawings Index

STANDARD DRAWINGS INDEX (Change 1, Dated 03/14/05)

UTAH DEPARTMENT OF TRANSPORTATION

U	NUMBER	TITLE	CURRENT DATE
		Advanced Traffic Management System (AT)	
U	AT 1	Legend Sheet	**02/24/05**
	AT 2	Ramp Meter Details	**02/24/05**
	AT 3	Ramp Meter Sign Panel	**02/24/05**
	AT 4	Typical Ramp Meter Signal Head Mounting	01/01/05
	AT 5	Ramp Meter Loop Installation	**02/24/05**
	AT 6	Conduit Details	**02/24/05**
	AT 7	Polymer-Concrete Junction Box Details	**02/24/05**
	AT 8	ATMS Cabinet	**02/24/05**
	AT 9	ATMS Cabinet Disconnect And Transformer Frame	**02/24/05**
	AT 10	CCTV Mounting Details	**02/24/05**
	AT 11	CCTV Pole Details	**02/24/05**
	AT 12	CCTV Pole Foundation For Dedicated CCTV Pole	**02/24/05**
	AT 13	Not Used	
	AT 14	Weigh In Motion Piezo Details	**02/24/05**
	AT 15	RWIS Site And Foundation Details	**02/24/05**
	AT 16	RWIS Tower Base And Service Pad Layout	**02/24/05**
	AT 17	Ground Rod Installation And Tower Grounding	**02/24/05**
	AT 18	TMS Detection Zone Layout	**02/24/05**
		Barriers (BA)	
U	BA 1A	Precast Concrete Full Barrier Standard Section	01/01/05
U	BA 1B	Precast Concrete Full Barrier Standard Section	01/01/05
U	BA 1C	Precast Concrete Barrier Terminal For Speed ≤ 40 MPH	01/01/05
	BA 1D	Precast Concrete Full Section Median Installation	01/01/05
	BA 1E	Precast Concrete Full Section Shoulder Applications	01/01/05

State Projects With 8 ½ x 11 Plan Sheets

U	NUMBER	TITLE	CURRENT DATE
	BA 2	Precast Concrete Half Barrier Standard Section	01/01/05
	BA 3A	Cast In Place Constant Slope Barrier	**02/24/05**
	BA 3B	Precast Concrete Constant Slope Transition Section For Crash Cushion And W-Beam Guardrail	**02/24/05**
U	BA 4A	W-Beam Guardrail Hardware	01/01/05
U	BA 4B	W-Beam Guardrail Transition	**02/24/05**
	BA 4C	W-Beam Guardrail Transition Curb Section	**02/24/05**
	BA 4D	W-Beam Guardrail Anchor Type I	01/01/05
	BA 4E	W-Beam Guardrail Installations	01/01/05
	BA 4F	W-Beam Guardrail Typicals Divided Roadways	01/01/05
	BA 4G	W-Beam Guardrail Typical Multilane Arterial	01/01/05
	BA 4H	W-Beam Guardrail Typical 2 Lane 2 Way	01/01/05
	BA 4I	W-Beam Guardrail Buried In Backslope Terminal	01/01/05
	BA 4J	W-Beam Guardrail Buried In Backslope Terminal With Rub Rail	01/01/05
	BA 4K	W-Beam Guardrail Buried In Backslope Terminal Anchor	01/01/05
	BA 4L	W-Beam Guardrail Curve Details	01/01/05
	BA 4M	W-Beam Guardrail Nested Guardrail 12’ 6” Span	01/01/05
	BA 4N	W-Beam Guardrail Nested Guardrail 18’ 9” Span	01/01/05
	BA 4O	W-Beam Guardrail Nested Guardrail 25’ Span	01/01/05
	BA 4P	W-Beam Guardrail With Precast Barrier For Span > 25’	01/01/05
		Catch Basins And Cleanouts (CB)	
	CB 1	Curb and Gutter Inlet	01/01/05
	CB 2	Open Curb Inlet	01/01/05
	CB 3	Shallow Catch Basin	01/01/05
	CB 4	Open Curb Shallow Catch Basin	01/01/05
	CB 5A	Standard Catch Basin and Cleanout Box	01/01/05
	CB 5B	Standard Catch Basin and Cleanout Box Section	01/01/05
	CB 6A	Drop Inlet Type “A”	01/01/05
	CB 6B	Berm Apron With Drop Inlet Type “A”	01/01/05

State Projects With 8 ½ x 11 Plan Sheets

U	NUMBER	TITLE	CURRENT DATE
	CB 7A	Drop Inlet Type “B”	01/01/05
	CB 7B	Normal Apron With Drop Inlet Type “B”	01/01/05
	CB 8A	Double Catch Basin	01/01/05
	CB 8B	Double Catch Basin	01/01/05
	CB 9A	Standard Catch Basin And Cleanout Box Situation And Layout	01/01/05
	CB 9B	Standard Catch Basin And Cleanout Box Section Details	01/01/05
	CB 9C	Standard Catch Basin And Cleanout Box Schedule Of Installation 18” to 42” RCP 12” to 48” CMP	01/01/05
	CB 9D	Standard Catch Basin And Cleanout Box Schedule Of Installation 48” to 66” RCP 60” to 78” CMP	01/01/05
	CB 10A	Standard Catch Basin And Cleanout Box Situation And Layout	01/01/05
	CB 10B	Standard Catch Basin And Cleanout Box Section Details	01/01/05
	CB 10C	Standard Catch Basin And Cleanout Box Schedule Of Installation 42” to 60” RCP 48” to 72” CMP	01/01/05
	CB 11	Standard Manhole	01/01/05
		Crash Cushions (CC)	
	CC 1	Crash Cushion Markings	01/01/05
	CC 2	Crash Cushion Drainage Details Guideline A	01/01/05
	CC 3	Crash Cushion Drainage Details Guideline B	01/01/05
	CC 4	Details For Placement Crash Cushions Type A, B, And D	01/01/05
	CC 5	Grading And Placement Details Crash Cushion Type C	01/01/05
	CC 6	Crash Cushion Type E Sand Barrel Details	01/01/05
	CC 7A	Grading And Installation Details Crash Cushion Type F Quad Trend 350	**02/24/05**
	CC 7B	Reserved For Future Use	
	CC 8A	Grading And Installation Details Crash Cushion Type G	**02/24/05**
	CC 8B	Grading And Installation Details For “3R” Projects Crash Cushion Type G	**02/24/05**
	CC 9A	Grading And Installation Details Crash Cushion Type H	**02/24/05**
	CC 9B	Grading And Installation Details Crash Cushion Type H (Parabolic Flare)	**02/24/05**

State Projects With 8 ½ x 11 Plan Sheets

U	NUMBER	TITLE	CURRENT DATE
		Diversion Boxes (DB)	
	DB 1A	Standard Diversion Box/Cover Plate/Grating For 18" DIA. or 24" DIA. Pipe	01/01/05
	DB 1B	Standard Diversion Box Hinged Lid Details For 18" DIA. or 24" DIA. Pipe	01/01/05
	DB 1C	Standard Diversion Box Bicycle - Safe Grating Details For 18" DIA. or 24" DIA. Pipe	01/01/05
	DB 1D	Standard Diversion Box Three Gate Box Sections For 18" DIA. or 24" DIA. Pipe	01/01/05
	DB 1E	Standard Diversion Box Three Gate Box Sections For 18" DIA. or 24" DIA. Pipe	01/01/05
	DB 1F	Standard Diversion Box Three Gate Box Sections For 18" DIA. or 24" DIA. Pipe	01/01/05
	DB 2A	Standard Diversion Box w/Interchangeable Walls, Bottom Slab, Walls And Apron Details	01/01/05
	DB 2B	Standard Diversion Box w/Interchangeable Walls, Quantities Schedule	01/01/05
	DB 2C	Standard Diversion Box w/Interchangeable Walls, Hand Slide Gate Details	01/01/05
	DB 2D	Standard Diversion Box Type "G" Hand Slide Gate Details	01/01/05
	DB 2E	Standard Diversion Box Hinged Lid (Solid Cover Plate) Type "A" Details Type I Plan	01/01/05
	DB 2F	Standard Diversion Box Hinged Lid (Solid Cover Plate) Type "A" Details Type II Plan	01/01/05
	DB 2G	Standard Diversion Box Hinged Lid Solid Cover Type "B" Details	01/01/05
	DB 2H	Standard Diversion Box Hinged Lid Solid Cover Type "B" And "C" Details	01/01/05
	DB 3A	Standard Diversion Box With Manhole Cover Situation And Layout	01/01/05
	DB 3B	Standard Diversion Box With Manhole Cover Up To 42" RCP And Up To 54" CMP	01/01/05
	DB 3C	Standard Diversion Box With Manhole Cover 48" to 72" RCP And 60" to 84" CMP	01/01/05
	DB 4	Standard Transition Concrete Lined Ditch To Pipe Or Diversion Box	01/01/05
		Design Drawings (DD)	
	DD 1	Superelevation And Widening	01/01/05
	DD 2	Surface Ditch, Benched Slope, And Cut Ditch Details	01/01/05
	DD 3	Climbing Lanes	01/01/05

State Projects With 8 ½ x 11 Plan Sheets

U	NUMBER	TITLE	CURRENT DATE
	DD 4	Geometric Design for Freeways (Roadway)	**02/24/05**
	DD 5	Entrance And Exit Ramps At Crossroads	01/01/05
	DD 6	Entrance And Exit Ramp Geometrics	01/01/05
	DD 7	Freeway Crossover	01/01/05
	DD 8	Structural Geometric Design Standards For Clearances	01/01/05
	DD 9	Structural Geometric Design Standards	01/01/05
	DD 10	Railroad Clearances At Highway Overpass Structures	01/01/05
	DD 11	Rural Multi Lane Highways Other Than Freeways	01/01/05
	DD 12	Rural Two Lane Highways	01/01/05
	DD 13	Frontage And Access Roads (Under 50 ADT)	01/01/05
	DD 14	Typical Rural 2 Lane Road With Median Lane And Deceleration Lane For Intersecting Crossroads	01/01/05
		Drainage (DG)	
	DG 1	Fill Height for Metal Pipe (Steel)	01/01/05
	DG 2	Fill Height for Metal Pipe (Aluminum)	01/01/05
	DG 3	Maximum Fill Height For HDPE And PVC Pipes	01/01/05
	DG 4	Pipe Minimum Cover	01/01/05
	DG 5	Plastic Pipe, Metal Pipe Or Pipe Arch Culvert Bedding	01/01/05
	DG 6	Precast Concrete Pipe Culvert	01/01/05
	DG 7	Gasketted Joints Or Coupling Bands For CMP	01/01/05
	DG 8	Metal Culvert End Section	01/01/05
	DG 9	Miscellaneous Pipe Details	01/01/05
		Environmental Controls (EN)	
	EN 1	Temporary Erosion Control (Check Dams)	01/01/05
	EN 2	Temporary Erosion Control (Silt Fence)	01/01/05
	EN 3	Temporary Erosion Control (Slope Drain And Temporary Berm)	01/01/05
	EN 4	Temporary Erosion Control (Drop Inlet Barriers)	01/01/05
	EN 5	Temporary Erosion Control (Sediment Trap And Curb Inlet Barrier)	01/01/05

State Projects With 8 ½ x 11 Plan Sheets

U	NUMBER	TITLE	CURRENT DATE
		Fence And Gates (FG)	
	FG 1A	Right Of Way Fence And Gates (Wood Post)	01/01/05
	FG 1B	Right Of Way Fence And Gates (Wood Post)	01/01/05
	FG 2A	Right Of Way Fence And Gates (Metal Post)	01/01/05
	FG 2B	Right Of Way Fence And Gates (Metal Post)	01/01/05
	FG 3	Swing Gates Type I For Gates Less Than 17’	**02/24/05**
	FG 4	Deer Gates	01/01/05
	FG 5	Swing Gates Type II For Gates Wider Than 17’	01/01/05
	FG 6	Chain Link Fence	01/01/05
		Grates, Frames, And Trash Racks (GF)	
	GF 1	Manhole Frame And Grated Cover	01/01/05
	GF 2	Manhole Frame And Solid Cover	01/01/05
	GF 3	Rectangular Grate And Frame	01/01/05
	GF 4	Directional Flow Grate And Frame	01/01/05
	GF 5	Solid Cover And Frame	01/01/05
	GF 6	Manhole Steps	01/01/05
	GF 7	Standard Screw Gate And Frame	01/01/05
	GF 8	2’ x 2’ Grate And Frame	01/01/05
	GF 9	28” x 24” Directional Flow Grate And Frame	01/01/05
	GF 10	Standard Trash Racks 90 ° X-ing Angle	01/01/05
	GF 11	Standard Trash Racks	01/01/05
	GF 12	Standard Trash Racks	01/01/05
	GF 13	Open Curb Inlet Grate and Frame	01/01/05
	GF 14	Solid Cover For Std Dwg DB 1 MS-18 Loading	01/01/05
	GF 15	Standard Screw Gate And Frame	01/01/05
		General Road Work (GW)	
	GW 1	Raised Median And Plowable End Section	01/01/05
	GW 2	Concrete Curb And Gutter	01/01/05
	GW 3	Concrete Curb And Gutter Details	01/01/05

State Projects With 8 ½ x 11 Plan Sheets

U	NUMBER	TITLE	CURRENT DATE
	GW 4	Concrete Driveways And Sidewalks	01/01/05
	GW 5A	Pedestrian Access	01/01/05
	GW 5B	Pedestrian Access	01/01/05
	GW 5C	Pedestrian Access	01/01/05
	GW 6	Right Of Way Marker	01/01/05
	GW 7	Newspaper And Mailbox Stop Layout	01/01/05
	GW 8	Newspaper And Mailbox Support Hardware	01/01/05
	GW 9	Delineation Hardware	01/01/05
	GW 10	Delineation Application	01/01/05
	GW 11	Sidewalks And Shoulders On Urban Roadways	01/01/05
		Paving (PV)	
	PV 1	Joints For Highways With Concrete Traffic Lanes And Shoulders	01/01/05
	PV 2	Pavement/Approach Slab Details	01/01/05
	PV 3	Concrete Pavement Details For Urban And Interstate	01/01/05
	PV 4	Concrete Pavement Details For Urban And Interstate	01/01/05
	PV 5	Urban Concrete Pavement Details	01/01/05
	PV 6	Rumble Strips	01/01/05
	PV 7	Rumble Strips - Typical Application	01/01/05
	PV 8	Note Used	
	PV 9	Dowel Bar Retrofit	01/01/05
		Signals (SL)	
	SL 1A	Traffic Signal Mast Arm Pole And Luminaire Extension	01/01/05
	SL 1B	Traffic Signal Mast Arm Pole And Luminaire Extension	01/01/05
	SL 2	Traffic Signal Mast Arm Details 30’ Thru 75’	01/01/05
	SL 3	Underground Service Pedestal Details	01/01/05
	SL 4	Traffic Signal Mast Arm Pole Foundation	01/01/05
	SL 5	Traffic Signal Pole	01/01/05
	SL 6	Pole Mounted Power Source Details	01/01/05

State Projects With 8 ½ x 11 Plan Sheets

U	NUMBER	TITLE	CURRENT DATE
	SL 7	Span Wire Signal Pole Details	01/01/05
	SL 8	Signal Head Details	01/01/05
	SL 9	Pedestrian Signal Assembly	01/01/05
	SL 10	Traffic Signal Controller Base Details	01/01/05
	SL 11	Traffic Signal Loop Detector Details	01/01/05
	SL 12	Traffic Counting Loop Detector Details	01/01/05
	SL 13	Not Used	
	SL 14	Highway Luminaire Pole Ground Mount	01/01/05
	SL 15	Luminaire Slip Base Details	01/01/05
	SL 16	Highway Luminaire Pole Barrier Mount	01/01/05
	SL 17	Highway Luminaire Pole Foundation Extension	01/01/05
	SL 18	Single Transformer Substation Details	01/01/05
		Signs (SN)	
	SN 1	Bridge Load Limits Signs	01/01/05
	SN 2	School Speed Limit Assembly	01/01/05
	SN 3	Overhead School Speed Limit Assembly	01/01/05
	SN 4	Flashing Stop Sign	01/01/05
	SN 5	Typical Installation For Milepost Signs	01/01/05
	SN 6	Speed Reduction Sign Sequence	01/01/05
	SN 7	Placement of Ground Mounted Signs	01/01/05
	SN 8	Ground Mounted Timber Sign Post (P1)	01/01/05
	SN 9	Ground Mounted Tubular Steel Sign Post (P2)	01/01/05
	SN 10	Ground Mounted Square Steel Sign Post (P3)	01/01/05
	SN 11	Slipbase Ground Mounted Tubular Steel Sign Post (P4)	01/01/05
	SN 12A	Ground Mounted Sign Installation Details	01/01/05
	SN 12B	Ground Mounted Sign Installation Details	01/01/05
	SN 12C	Ground Mounted Sign Installation Details	01/01/05
		Striping (ST)	
	ST 1	Object Markers “T” Intersection And Pavement Transition Guidance	01/01/05

State Projects With 8 ½ x 11 Plan Sheets

U	NUMBER	TITLE	CURRENT DATE
	ST 2	Freeway Crossover Markings	01/01/05
U	ST 3	Typical Pavement Markings	01/01/05
	ST 4	Crosswalks, Parking And Intersection Approaches	01/01/05
	ST 5	Painted Median And Auxiliary Lane Details	**02/24/05**
	ST 6	Passing/Climbing Lanes Traffic Control	01/01/05
	ST 7	Pavement Markings And Signs At Railroad Crossing	01/01/05
	ST 8	Plowable Pavement Markers	01/01/05
	ST 9	School Crossing And School Message	01/01/05
		Structures And Walls (SW)	
	SW 1A	Welded End Guard Unit	01/01/05
	SW 1B	Precast Concrete Cattle Guard	01/01/05
	SW 2	Noise Wall Placement Area	01/01/05
	SW 3A	Precast Concrete Noise Wall 1 Of 2	01/01/05
	SW 3B	Precast Concrete Noise Wall 2 Of 2	01/01/05
	SW 4A	Precast Concrete Retaining/Noise Wall 1 Of 2	01/01/05
	SW 4B	Precast Concrete Retaining/Noise Wall 2 Of 2	01/01/05
		Traffic Control (TC)	
U	TC 1A	Construction Zone Channelization Devices	01/01/05
U	TC 1B	Construction Zone Signing	01/01/05
U	TC 2A	Traffic Control General	01/01/05
U	TC 2B	Traffic Control General	01/01/05
U	TC 3	Traffic Control Project Limit Signing	01/01/05
U	TC 4	Traffic Control Urban Intersections With Roadways Under 50 MPH	01/01/05
U	TC 5	Traffic Control Urban Intersections With Roadways Under 50 MPH	01/01/05
U	TC 6	Traffic Control Pedestrian Routing	01/01/05
U	TC 7	Traffic Control Road Closed, Detour	01/01/05
U	TC 8	Traffic Control Lane Closure	01/01/05
U	TC 9	Traffic Control Multilane Closure	01/01/05

State Projects With 8 ½ x 11 Plan Sheets

U	NUMBER	TITLE	CURRENT DATE
U	TC 10	Traffic Control Expressway And Freeway Crossover/Turn Around	01/01/05
U	TC 11	Traffic Control Exit Ramp Gore	01/01/05
U	TC 12	Traffic Control Entrance Ramp Gore	01/01/05
U	TC 13	Traffic Control Shoulder-Haul Road	01/01/05
U	TC 14	Traffic Control Flagging Operation	01/01/05
U	TC 15	Traffic Control 2 Lane/2 Way Seal Coat With Cover Material	01/01/05
U	TC 16	Traffic Control Pavement Marking	01/01/05

XI. Equal Opportunity (State Projects)

Selection of Subcontractors, Service Providers, Procurement of Materials and Leasing of Equipment:

Do not discriminate on the grounds of race, color, religion, sex, national origin, age or disability in the selection and retention of subcontractors, including procurement of materials and leases of equipment.

Notify all potential subcontractors and suppliers of his/her EEO obligations under this contract.

Disadvantaged business enterprises (DBE), as defined in 49 CFR 23, have equal opportunity to compete for and perform subcontracts that the contractor enters into pursuant to this contract. Use best efforts to solicit bids from and to utilize DBE subcontractors or subcontractors with meaningful minority group and female representation among their employees. Obtain lists of DBE construction firms from SHA personnel.

Use best efforts to ensure subcontractor compliance with their EEO obligations.

Selection of Labor:

During the performance of this contract, do not discriminate against labor from any other State, possession, or territory of the United States.

Employment Practices:

During the performance of this contract, the Contractor agrees as follows:

Do not discriminate against any employee or applicant for employment because of race, religion, sex, color, national origin, age, or disability. Take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, religion, sex, color, national origin, age, or disability. Such action includes, but is not be limited to the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoffs or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Agree to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the State Department of Transportation setting forth the provisions of this nondiscrimination clause.

In all solicitations or advertisements for employees state that all qualified applicants receive consideration for employment without regard to race, religion, sex, color, national origin, age, or disability.

Send to each labor union or representative of workers that the Contractor has a collective bargaining agreement or other contract or understanding, a notice to be provided by the State Department of Transportation advising the said labor union or worker' representative of the commitments under this section and post copies of the notice in conspicuous places available to employees and applicants for employment.

In the event of noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations or orders, this contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further State contracts.

Include the provisions of this Section in every subcontract or purchase order so that such provision will be binding upon each Subcontractor or vendor. Take such action with respect to any subcontract or purchase order as the State Department of Transportation may direct as a means of enforcing such provisions including sanctions for noncompliance.

XII. Special Provisions and Supplemental Specifications

April 1, 2005

SPECIAL PROVISION

SP -9999(750)

SECTION 00555M

PROSECUTION AND PROGRESS

PART 1 GENERAL

1.1 RELATED SECTIONS

Add the following paragraphs to Article 1.9, Limitation of Operations

D. Inform the traveling public of upcoming work one week prior to the start of construction with Variable Message Signs. The message will be determined by the Resident Engineer. Use Variable Message Signs during the construction period.

E. Schedule shall be approved by the Project Engineer prior to beginning any portion of this project. No work or lane restrictions will be allowed on holidays or holiday weekends
.

F. Maintain a minimum of one 12 ft. traffic lane open at all times and a minimum of
one lane in each direction on I-15.

G. Provide portable traffic signals or other approved means of 24 hour a day traffic
control as needed on SR-23 and county road over I-84.

March 3, 2005

SPECIAL PROVISION

SP -9999(750)

SECTION 00725M

SCOPE OF WORK

Add the following Article to Part 1, General:

1.20 GENERAL INFORMATION

A. Perform the following Work:
   1. IF-514 and 3F-514
      a. Place polymer overlay. Seal top and roadway sides of parapet, and columns and bents.
      b. Place pavement marking tape.
   2. IF-516 and 3F-516
      a. Place polymer overlay.
      b. Seal top and roadway sides of parapet.
      c. Place pavement marking tape.
   3. IF-518 and 3F-518
      a. Place polymer overlay.
      b. Seal top and roadway sides of parapet.
      c. Place pavement marking tape
   4. OC-687
      a. Place polymer overlay.
      b. Seal top and roadway sides of parapet.
      c. Repair potholes with quick set material.
      d. Place HMA level pad.
      e. Place 200 ft. of State Furnished Concrete Barrier on each approach to the structure.
      f. Place 100 ft. of State Furnished Concrete Barriers and Terminal Sections on each trailing end of structure.
      g. Place crash cushions on approach ends of State Furnished Concrete Barrier.

B. The Utah Department of Transportation reserves the right to cancel all or portions of the contract.

January 18, 2005

SPECIAL PROVISION

SP-9999(750)

SECTION 00820M

LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

Delete Article 1.16 and replace with the following:

1.16 INSURANCE REQUIREMENTS

A. Workers' Compensation Insurance
   1. Provide Workers' Compensation Insurance to cover full liability. As a minimum, comply with the statutory limits defined by the State of Utah.

B. General Liability Insurance
   1. Provide General Liability insurance with the following minimum limits of liability:
      a. $1,000,000 Bodily Injury and Property Damage – Each Accident
      b. $2,000,000 General Aggregate
      c. $2,000,000 Products and Complete Operations Annual Aggregate

C. Excess General Liability Insurance
   1. Provide Excess Liability Insurance with the following minimum limits:
      a. $5,000,000 Each Claim
      b. $5,000,000 Aggregate

D. Automobile Liability Insurance
   1. Provide Automobile Liability Insurance for claims arising from the ownership, maintenance, or use of motor vehicles involved in project work with the following minimum limits:
      a. $1,000,000 Combined single Limit Bodily Injury and Property Damage per Occurrence

E. Provide the following for all required liability insurance policies:
   1. Where and when applicable, name as insured, only in respect to work to be performed under this Contract, the State of Utah and all institutions, agencies, departments, authorities, and

instrumentalities, and while acting within the scope of their duties, all volunteers as well as members of governing bodies, boards, commissions, and advisory committees.

2. Coverage for the above insured is primary and not contributing.
3. Incorporate into the insurance policy this statement: "Insurance coverage is extended to include claims reported up to one year beyond the date of substantial completion of this Contract."

F. Provide UDOT with certificates of insurance showing coverage as required above at the time the contract is executed and maintain the policy in force during the entire period of the Contract. The certificates will also state that the policies required are endorsed to give UDOT (the Engineer) not less than 30 days prior notice in the event of cancellation or change in coverage.

G. Regardless of the Contractor insurance requirements required in this section, insolvency, bankruptcy, or failure of any insurance company to pay all claims accrued does not relieve Contractor of any obligations.

H. Endorse all policies to include waivers of subrogation in favor of UDOT.

Supplemental Specification
2005 Standard Specification Book

SECTION 01282M

PAYMENT

Add the following to Part 1, Article 1.1:

D. Section 01284: Prompt Payment

Delete Article 1.14, paragraph E and replace with the following:

E. From the total value of work, the Department deducts and retains five percent until after the entire Contract has been completed in an acceptable manner, with the following exceptions:
   a. Retention for subcontracted work paid upon satisfactory completion and acceptance by the Department. Refer to Section 01284.
   b. When no less than 95 percent of the work has been completed, and with the consent of the Surety, the Engineer may prepare a semi-final estimate from which the Department retains 1½ percent of the original contract amount. The Department certifies the remainder for payment, less all previous payments.

March 30, 2005

SPECIAL PROVISION

SP-9999(750)

SECTION 02741S

HOT MIX ASPHALT – LEVELING PAD

Delete Section 02741 in its entirety and replace with the following:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Products and procedures for constructing a surface course of one or more layers of HMA comprised of aggregate, asphalt binder, lime and other additives from a commercial source for a leveling pad.

B. Mix materials at a central mixing plant.

1.2 RELATED SECTIONS

A. Section 02741: Hot Mix Asphalt (HMA)

B. Section 02745: Asphalt Material

C. Section 02746: Hydrated Lime

D. Section 02748: Prime Coat/Tack Coat

1.3 REFERENCES

A. AASHTO T 11: Materials Finer Than 75 μm (No. 200) Sieve In Mineral Affregates By Washing

B. AASHTO T 19: Bulk Density ("Unit Weight") and Voids in Aggregate

C. AASHTO T 27: Sieve Analysis Of Fine and Coarse Aggregates

D. AASHTO T 30: Mechanical Analysis of Extracted Aggregate

E. AASHTO T 89: Determining the Liquid Limit of Soils

F. AASHTO T 90: Determining the Plastic Limit and Plasticity Index of Soils

G. AASHTO T 96: Resistance to Abrasion of Small Size Coarse Aggregate by Use of the Los Angeles Machine

H. AASHTO T 104: Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate

I. AASHTO T 112: Clay Lumps and Friable Particles in Aggregate

J. AASHTO T 176: Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test

K. AASHTO T 304: Uncompacted Void Content of Fine Aggregate

L. AASHTO T 308: Determining the Asphalt Binder Content of Hot Mix Asphalt (HMA) by the Ignition Oven

M. AASHTO TP 4: Method for Preparing and Determining the Density of Hot-Mix Asphalt (HMA) Specimens by Means of the Superpave Gyratory Compactor

N. ASTM D 4791: Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate

O. ASTM D 5821: Determining the Percentage of Fractured Particles in Coarse Aggregate

1.4 ACCEPTANCE

A. Certify that the mix meets the gradation and asphalt binder requirements of Aggregate Gradation Table (Table 2) and Job Mix Design Requirements. Submit design data sheet to support. AASHTO T 30, T 308.

1. As an alternative provide a commercially produced HMA that has a proven performance history in the project area. Certify the binder content and gradation meet the job mix design.

B. By engineer by visual inspection.

PART 2 PRODUCTS

2.1 ASPHALT MATERIALS

A. Use the following asphalt materials:
   1. Asphalt Binder: Performance Graded (PG) Binder.
   2. Flush Coat: CSS-1 or SS-1.

2.2 AGGREGATE

A. Refer to Section 02741 except for Aggregate Properties Table.
B. Use Table 1 following for Aggregate Properties.

Table 1
Aggregate Properties

Properties	Test Method	Test Requirements
One Fractured Face	ASTM D 5821	N/A
Two Fractured Face	ASTM D 5821	90% Min.
Fine Agg. Angularity	AASHTO T 304	45 Min.
Flat & Elongated 1:3 Ratio	ASTM D 4791 (Based on 3/8 inch and above)	20 % Max.
L.A. Wear	AASHTO T 96	35 % Max.
Sand Equivalent	AASHTO T 176	45 Min.
Plasticity Index	AASHTO T 89 and T 90	0
Unit Weight	AASHTO T 19	75 lb/ft^3 Min.
Soundness Loss	AASHTO T 104 - Sodium Sulfate	16 % Max. loss with five cycles
Deleterious Materials	AASHTO T 112	2 % Max.
Natural Fines	---	10% Max.

C. Meet gradation in Table 2.

Table 2 Aggregate Gradations (Percent Passing by Dry Weight of Aggregate) AASHTO T 11 & AASHTO T 27		
Sieve Size		**Percent**
Control Sieves	**1/2 inch**	100.0
	3/8 inch	90.0 - 100.0
	# 4	< 90.0
	# 8	32.0 - 67.0
	# 200	2.0 - 10.0

2.3 HYDRATED LIME

A. Use a minimum of one percent hydrated lime.

B. Meet requirements of Section 02746.

2.4 VOLUMETRIC DESIGN REQUIREMENTS

A. Hot Mix supplier is responsible for satisfying all requirements for Superpave Volumetric Mix Design:
   1. Use a laboratory qualified by UDOT Central Quality Assurance Section in the use of the Superpave Gyratory Compactor. AASHTO TP 4.
   2. Certify that the mix design meets requirements for Volumetric Mix Design outlined in this section.
   3. Project Engineer may accept the Volumetric Mix Design from data submitted with the proposed mix design or from a previous mix design. The Region Materials Engineer reserves the right to verify any mix design submitted.

B. Comply with requirements in Table 3.
   1. Obtain Mixing Temperature from the Engineer.

Table 3 Superpave Volumetric Mix Design		
Compaction Stage	**Number of Gyrations (N)**	**% of G_{mm} (AASHTO T209)**
Initial	6	# 91.5
Design	50	$ 98.5
Maximum	75	#100.0

2.5 ALTERNATIVE MIX DESIGN REQUIREMENTS

A. Provide a commercially available HMA that has been used successfully in the project area.
   1. Provide a job mix deign including percent binder in mix and gradation.
   2. Provide Marshall, Hveem or Superpave design data for the mix proposed.
   3. Provide a list of projects in the area where the mix has been successfully used.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

A. Refer to Section 02741, Part 3.

3.2 COMPACTION

A. Establish a rolling pattern to obtain maximum density without over-stressing the pavement.

3.3 ASPHALT EMULSION

A. Apply the flush coat at a uniform rate of 0.10 gal/yd^2 undiluted emulsion or 0.15 gal/yd^2 2:1 diluted emulsion. Note: 2:1 diluted emulsion represents two parts undiluted emulsion and one part water.

END OF SECTION

March 29, 2005

SPECIAL PROVISION

PROJECT #SP-9999(750)

SECTION 02745S

ASPHALT MATERIAL

Delete section 02745 in its entirety and replace with the following:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Asphalt materials

1.2 PAYMENT PROCEDURES

A. Price adjustments for asphalt cement and liquid asphalt (chip-seal emulsions and/or cut-backs):
   1. Standard department procedures governs price adjustments made where asphalt material does not conform to the specifications
      a. If the price adjustment exceeds 30 percent, the Engineer may order the removal of any or all the defective asphalt material.
      b. The pay factor for such material is 0.50 when allowed to remain in place.

B. Price adjustments for Performance Graded Asphalt Binder (PGAB):
   1. Standard department PGAB management plan governs price reductions or removal of material where the binder does not conform to the specifications.

1.3 REFERENCES

A. AASHTO M 81: Cut-Back Asphalt (Rapid-Curing Type)

B. AASHTO M 82: Cut-Back Asphalt (Medium-Curing Type)

C. AASHTO M 140: Emulsified Asphalt

D. AASHTO M 208: Cationic Emulsified Asphalt

E. AASHTO M 226: Viscosity Graded Asphalt Cement

F. AASHTO M 320: Performance Graded Asphalt Cement

G. AASHTO R 28: Accelerated Aging of Asphalt Binder Using a Pressurized Aging Vessel (PAV)

H. AASHTO T 44: Solubility of Bituminous Materials

I. AASHTO T 48: Flash and Fire Points by Cleveland Open Cup

J. ASHTO T 49: Penetration of Bituminous Materials

K. AASHTO T 50: Float Test for Bituminous Materials

L. AASHTO T 51: Ductility of Bituminous Materials

M. AASHTO T 59: Testing Emulsified Asphalt

N. AASHTO T 201: Kinematic Viscosity of Asphalts

O. AASHTO T 228: Specific Gravity of Semi-Solid Bituminous Materials

P. AASHTO T 240: Effect of Heat and Air on a Moving Film of Asphalt (Rolling Thin-Film Oven Test)

Q. AASHTO T 300: Force Ductility of Bituminous Materials

R. AASHTO T 301: Elastic Recovery Test of Bituminous Materials by Means of a Ductilometer

S. AASHTO T 313: Determining the Flexural Creep Stiffness of Asphalt Binder Using the Bending Beam Rheometer (BBR)

T. AASHTO T 314: Determining the Fracture Properties of Asphalt Binder in Direct Tension

U. AASHTO T 315: Determining the Rheological Properties of Asphalt Binder Using a Dynamic Shear Rheometer (DSR)

V. AASHTO T 316: Viscosity Determination of Asphalt Binder Using Rotational Viscometer

W. ASTM D 92: Flash and Fire Points by Cleveland Open Cup

X. ASTM D 1190: Concrete Joint Sealer, Hot-Applied Elastic Type

Y. ASTM D 2006-70: Method of Test for Characteristic Groups in Rubber Extender and Processing Oils by the Precipitation Method.

Z. ASTM D 2007: Characteristic Groups in Rubber Extender and Processing Oils and Other Petroleum-Derived Oils by the Clay-Gel Absorption Chromatographic Method

AA. ASTM D 2026: Cutback Asphalt (Slow-Curing Type)

BB. ASTM D 3405: Joint Sealants, Hot-Applied, for Concrete and Asphalt Pavements

CC. ASTM D 4402: Viscosity Determinations of Unfilled Asphalts Using the Brookfield Thermosel Apparatus

DD. ASTM D 5329: Sealants and Fillers, Hot-Applied, For Joints and Cracks in Asphaltic and Portland Cement Concrete Pavements

EE. ASTM D 5801: Toughness and Tenacity of Bituminous Materials

FF. California Test Methods

GG. UDOT Materials Manual of Instruction

HH. UDOT Minimum Sampling and Testing Guide

1.4 SUBMITTALS

A. For each shipment of material, supply a vendor-prepared bill of lading showing the following information:
   1. Type and grade of material
   2. Type and amount of additives, used, if applicable
   3. Destination
   4. Consignee's name
   5. Date of Shipment
   6. Railroad car or truck identification
   7. Project number
   8. Loading temperature
   9. Net weight in tons (or net gallons corrected to 60 degrees F, when requested)
   10. Specific gravity
   11. Bill of lading number
   12. Manufacturer of asphalt material

1.5 DELIVERY, STORAGE, AND HANDLING

A. Each shipment of asphalt material must:
   1. Be uniform in appearance and consistency.
   2. Show no foaming when heated to the specified loading temperature.

B. Do not supply shipments contaminated with other asphalt types or grades than those specified.

1.6 GRADE OF MATERIAL

A. The Engineer determines the grade of material to be used based on the supply source designated by the Contractor when the bid proposal lists more than one grade of asphalt material.

PART 2 PRODUCTS

2.1 PERFORMANCE GRADED ASPHALT BINDER (PGAB)

A. Supply PGABs under the Approved Supplier Certification (ASC) System. Refer to the UDOT Minimum Sampling and Testing Guide, Section 509, Asphalt Binder Management Plan.

B. As specified in AASHTO M 320 for all PGABs having algebraic differences less than 92 degrees between the high and low design temperatures.

C. As specified in Tables 1, 2, 3, 4, 5, 6, 7, and 8 for all PGABs having algebraic differences equal to or greater than 92 degrees between the high and low design temperatures.

Table 1

PG58-34		
Original Binder		
Dynamic Shear Rheometer, AASHTO T 315	@58°C, G*, kPa	1.30 Min.
	@58°C, phase angle, degrees	74.0 Max.
Rotational Viscometer, AASHTO T 316	@135°C, Pa.s	3 Max.
Flash Point, AASHTO T 48	°C	260 Min.
RTFO Residue, AASHTO T 240		
Dynamic Shear Rheometer, AASHTO T 315	@5°C, G*/sinδ, kPa	2.20 Min.
Elastic Recovery, AASHTO T 301 mod[1]	%	65 Min.
PAV Residue, 20 hours, 2.10 Mpa, 100 °C, AASHTO R 28		
Dynamic Shear Rheometer, AASHTO T 315	@16°C, kPa	5000 Max.
Bending Beam Rheometer, AASHTO T 313	@-24°C, S, MPa	300 Max.
	@-24°C, m-value	0.300 Min.
Direct Tension Test, AASHTO T 314	@-24°C, Failure Strain, %	1.5 Min.
	@-24°C, Failure Stress[2], MPa	4.0 Min.

[1]Modify paragraph 4.5 as follows: After 20 cm has been reached, stop the ductilometer and within 2 seconds, sever the specimen at its center with a pair of scissor…
[2] No allowances will be given for passing at a colder grade

Table 2

PG64-28		
Original Binder		
Dynamic Shear Rheometer, AASHTO T 315	@64°C, G*, kPa	1.30 Min.
	@64°C, phase angle, degrees	74.0 Max.
Rotational Viscometer, AASHTO T 316	@135°C, Pa.s	3 Max.
Flash Point, AASHTO T 48	°C	260 Min.
RTFO Residue, AASHTO T 240		
Dynamic Shear Rheometer, AASHTO T 315	@64°C, G*/sinδ, kPa	2.20 Min.
Elastic Recovery, AASHTO T 301 mod[1]	%	65 Min.
PAV Residue, 20 hours, 2.10 Mpa, 100 °C, AASHTO R 28		
Dynamic Shear Rheometer, AASHTO T 315	@22°C, kPa	5000 Max.
Bending Beam Rheometer, AASHTO T 313	@-18°C, S, MPa	300 Max.
	@-18°C, m-value	0.300 Min.
Direct Tension Test, AASHTO T 314	@-18°C, Failure Strain, %	1.5 Min.
	@-18°C, Failure Stress[2], MPa	4.0 Min.

[1]Modify paragraph 4.5 as follows: After 20 cm has been reached, stop the ductilometer and within 2 seconds, sever the specimen at its center with a pair of scissors…
[2] No allowances will be given for passing at a colder grade

Table 3

PG64-34		
Original Binder		
Dynamic Shear Rheometer, AASHTO T 315	@64°C, G*, kPa	1.30 Min.
	@64°C, phase angle, degrees	71.0 Max.
Rotational Viscometer, AASHTO T 316	@135°C, Pa.s	3 Max.
Flash Point, AASHTO T 48	°C	260 Min.
RTFO Residue, AASHTO T-240		
Dynamic Shear Rheometer, AASHTO T 315	@64°C, G*/sinδ, kPa	2.20 Min.
Elastic Recovery, AASHTO T 301 mod[1]	%	70 Min.
PAV Residue, 20 hours, 2.10 Mpa, 100 °C, AASHTO R 28		
Dynamic Shear Rheometer, AASHTO T 315	@19°C, kPa	5000 Max.
Bending Beam Rheometer, AASHTO T 313	@-24°C, S, MPa	300 Max.
	@-24°C, m-value	0.300 Min.
Direct Tension Test, AASHTO T 314	@-24°C, Failure Strain, %	1.5 Min.
	@-24°C, Failure Stress[2], MPa	4.0 Min.

[1]Modify paragraph 4.5 as follows: After 20 cm has been reached, stop the ductilometer and within 2 seconds, sever the specimen at its center with a pair of scissors…
[2] No allowances will be given for passing at a colder grade

Table 4

PG70-22		
Original Binder		
Dynamic Shear Rheometer, AASHTO T 315	@70°C, G*, kPa	1.30 Min.
	@70°C, phase angle, degrees	74.0 Max.
Rotational Viscometer, AASHTO T 316	@135°C, Pa.s	3 Max.
Flash Point, AASHTO T 48	°C	260 Min.
RTFO Residue, AASHTO T 240		
Dynamic Shear Rheometer, AASHTO T 315	@70°C, G*/sinδ, kPa	2.20 Min.
Elastic Recovery, AASHTO T 301 mod[1]	%	65 Min.
PAV Residue, 20 hours, 2.10 Mpa, 100 °C, AASHTO R 28		
Dynamic Shear Rheometer, AASHTO T 315	@28°C, kPa	5000 Max.
Bending Beam Rheometer, AASHTO T 313	@-12°C, S, MPa	300 Max.
	@-12°C, m-value	0.300 Min.
Direct Tension Test, AASHTO T 314	@-12°C, Failure Strain, %	1.5 Min.
	@-12°C, Failure Stress[2], MPa	4.0 Min.

[1]Modify paragraph 4.5 as follows: After 20 cm has been reached, stop the ductilometer and within 2 seconds, sever the specimen at its center with a pair of scissors…
[2] No allowances will be given for passing at a colder grade

Table 5

PG70-28		
Original Binder		
Dynamic Shear Rheometer, AASHTO T 315	@70°C, G*, kPa	1.30 Min.
	@70°C, phase angle, degrees	71.0 Max.
Rotational Viscometer, AASHTO T 316	@135°C, Pa.s	3 Max.
Flash Point, AASHTO T 48	°C	260 Min.
RTFO Residue, AASHTO T 240		
Dynamic Shear Rheometer, AASHTO T 315	@70°C, G*/sinδ, kPa	2.20 Min.
Elastic Recovery, AASHTO T 301 mod[1]	%	70 Min.
PAV Residue, 20 hours, 2.10 Mpa, 100 °C, AASHTO R 28		
Dynamic Shear Rheometer, AASHTO T 315	@25°C, kPa	5000 Max.
Bending Beam Rheometer, AASHTO T 313	@-18°C, S, MPa	300 Max.
	@-18°C, m-value	0.300 Min.
Direct Tension Test, AASHTO T 314	@-18°C, Failure Strain, %	1.5 Min.
	@-18°C, Failure Stress[2], MPa	4.0 Min.

[1]Modify paragraph 4.5 as follows: After 20 cm has been reached, stop the ductilometer and within 2 seconds, sever the specimen at its center with a pair of scissors…
[2] No allowances will be given for passing at a colder grade

Table 6

PG70-34		
Original Binder		
Dynamic Shear Rheometer, AASHTO T 315	@70°C, G*, kPa	1.30 Min.
	@70°C, phase angle, degrees	71.0 Max.
Rotational Viscometer, AASHTO T 316	@135 °C, Pa.s	3 Max.
Flash Point, AASHTO T 48	°C	260 Min.
RTFO Residue, AASHTO T 240		
Dynamic Shear Rheometer, AASHTO T 315	@70°C, G*/sinδ, kPa	2.20 Min.
Elastic Recovery, AASHTO T 301 mod[1]	%	75 Min.
PAV Residue, 20 hours, 2.10 Mpa, 100 °C, AASHTO R 28		
Dynamic Shear Rheometer, AASHTO T 315	@22°C, kPa	5000 Max.
Bending Beam Rheometer, AASHTO T 313	@-24°C, S, MPa	300 Max.
	@-24°C, m-value	0.300 Min.
Direct Tension Test, AASHTO T 314	@-24°C, Failure Strain, %	1.5 Min.
	@-24°C, Failure Stress[2], MPa	4.0 Min.

[1]Modify paragraph 4.5 as follows: After 20 cm has been reached, stop the ductilometer and within 2 seconds, sever the specimen at its center with a pair of scissors…
[2] No allowances will be given for passing at a colder grade

Table 7

PG76-22		
Original Binder		
Dynamic Shear Rheometer, AASHTO T 315	@76°C, G*, kPa	1.30 Min.
	@76°C, phase angle, degrees	71.0 Max.
Rotational Viscometer, AASHTO T 316	@135°C, Pa.s	3 Max.
Flash Point, AASHTO T 48	°C	260 Min.
RTFO Residue, AASHTO T 240		
Dynamic Shear Rheometer, AASHTO T 315	@76°C, G*/sinδ, kPa	2.20 Min.
Elastic Recovery, AASHTO T 301 mod[1]	%	70 Min.
PAV Residue, 20 hours, 2.10 Mpa, 100 °C, AASHTO R 28		
Dynamic Shear Rheometer, AASHTO T 315	@ 31°C, kPa	5000 Max.
Bending Beam Rheometer, AASHTO T 313	@-12°C, S, MPa	300 Max.
	@-12°C, m-value	0.300 Min.
Direct Tension Test, AASHTO T 314	@-12°C, Failure Strain, %	1.5 Min.
	@-12°C, Failure Stress[2], MPa	4.0 Min.

[1]Modify paragraph 4.5 as follows: After 20 cm has been reached, stop the ductilometer and within 2 seconds, sever the specimen at its center with a pair of scissors…
[2] No allowances will be given for passing at a colder grade

Table 8

PG76-28		
Original Binder		
Dynamic Shear Rheometer, AASHTO T 315	@76°C, G*, kPa	1.30 Min.
	@76°C, phase angle, degrees	71. 0 Max.
Rotational Viscometer, AASHTO T 316	@135°C, Pa.s	3 Max.
Flash Point, AASHTO T 48	°C	260 Min.
RTFO Residue, AASHTO T 240		
Dynamic Shear Rheometer, AASHTO T 315	@76°C, G*/sinδ, kPa	2.20 Min.
Elastic Recovery, AASHTO T 301 mod[1]	%	75 Min.
PAV Residue, 20 hours, 2.10 Mpa, 100 °C, AASHTO R 28		
Dynamic Shear Rheometer, AASHTO T 315	@28°C, kPa	5000 Max.
Bending Beam Rheometer, AASHTO T 313	@-18°C, S, MPa	300 Max.
	@-18°C, m-value	0.300 Min.
Direct Tension Test, AASHTO T 314	@-18°C, Failure Strain, %	1.5 Min.
	@-18°C, Failure Stress[2], MPa	4.0 Min.

[1]Modify paragraph 4.5 as follows: After 20 cm has been reached, stop the ductilometer and within 2 seconds, sever the specimen at its center with a pair of scissors…
[2] No allowances will be given for passing at a colder grade

2.2 ASPHALTIC CEMENT, LIQUID ASPHALTS, REJUVENATING AGENTS

A. As specified in AASHTO M 226, Table 2 with the following modifications:
   1. Delete and replace ductility at 77EF (25EC) with ductility at 39.2EF (4EC) with values as detailed below.

AC - 2.5	AC - 5	AC - 10	AC - 20
50+	25+	15+	5+

B. As specified for cationic and anionic emulsified asphalt.
   1. All standard Slow Setting (SS, CSS), Medium Setting (MS, CMS), and Rapid Setting (RS, CRS) grades; inclusive of all High-Float designations (HF).
   2. Supply under the Approved Supplier Certification System (ASC).
   3. Meet AASHTO M 208 and M 140.

C. Conform to the requirements of one of these tables:
   1. Table 9: Cationic Rapid Setting Emulsified Polymerized Asphalt (CRS-2P)
   2. Table 10: Latex Modified Cationic Rapid Setting Emulsified Asphalt (LMCRS-2)
   3. Table 11: Cationic Medium Setting Emulsified Asphalt (CMS-2S)
   4. Table 12: High Float Medium Setting Emulsified Asphalt (HFMS-2)
   5. Table 13: High Float Medium Setting Emulsified Polymerized Asphalt (HFMS-2P)
   6. Table 14: High Float Medium Setting Emulsified Polymerized Asphalt (HFMS-2SP)
   7. Table 15: High Float Rapid Setting Emulsified Polymerized Asphalt (HFRS-2P)
   8. Table 16: Cationic Rapid Setting Emulsified Asphalt (CRS-2A, B)

D. Curing cut-back asphalt:
   1. As specified for slow curing (SC) in ASTM D 2026.
   2. As specified for medium curing (MC) in AASHTO M 82.
   3. As specified for rapid curing (RC) in AASHTO M 81.

E. Conform to requirements for Emulsified Asphalt Pavement Rejuvenating Agent:
   1. Table 17: Type A
   2. Table 18: Type B
   3. Table 19: Type B Modified
   4. Table 20: Type C
   5. Table 21: Type D

Table 9

Cationic Rapid Setting Emulsified Polymerized Asphalt (CRS-2P)			
Tests	**AASHTO Test Method**	**Min.**	**Max.**
Emulsion			
Viscosity , SF, 140EF (60EC), s (Project-site Acceptance/Rejection Limits)	T59	100	400
Settlement (a) 5 days, percent	T 59		5
Storage Stability Test (b) 1 d, 24 h, percent	T 59		
Demulsibility (c) 35 ml, 0.8% sodium dioctyl Sulfosucinate, percent	T 59	40	
Particle Charge Test	T 59	Positive	
Sieve Test, percent	T 59		0.10
Distillation			
Oil distillate, by volume of emulsion, percent			0
Residue (d), percent		68	
Residue from Distillation Test			
Penetration, 77EF(25EC), 100 g, 5 s, dmm	T 49	80	150
Ductility, 39.2EF(4EC), 5 cm/min, cm Toughness, lb-in Tenacity, lb-in	T 51 ASTM D 5801 ASTM D 5801	35 75 50	
Solubility in trichloroethylene, percent	T 44	97.5	

(a) The test requirement for settlement may be waived when the emulsified asphalt is used in less than a five-day time; or the purchaser may require that the settlement test be run from the time the sample is received until it is used, if the elapsed time is less than 5 days.

(b) The 24-hour (1-day) storage stability test may be used instead of the five-day settlement test.

(c) The demulsibility test is made within 30 days from date of shipment.

(d) Distillation is determined by AASHTO T 59, with modifications to include a 350 ± 5EF (177±3°C) maximum temperature to be held for 15 minutes.

Modify the asphalt cement prior to emulsification.

Table 10

Latex Modified Cationic Rapid Setting Emulsified Asphalt (LMCRS-2)			
Tests	**AASHTO Test Method**	**Min.**	**Max.**
Emulsion			
Viscosity, SF, 122EF (50EC), s (Project Site Acceptance/Rejection Limits)	T59	140	400
Settlement (a) 5 days, percent	T 59		5
Storage Stability Test (b) 1 d, 24 h, percent	T 59		1
Demulsibility (c) 35 ml, 0.8% sodium dioctyl Sulfosucinate, percent	T 59	40	
Particle Charge Test	T 59	Positive	
Sieve Test, percent	T 59		0.3
Distillation			
Oil distillate, by volume of emulsion, percent			0
Residue (d), percent		65	
Residue from Distillation Test			
Penetration, 77EF (25EC), 100 g, 5 s, dmm	T 49	40	200
Torsional Recovery (e)		18	

(a) The test requirement for settlement may be waived when the emulsified asphalt is used in less than a five-day time; or the purchaser may require that the settlement test be run from the time the sample is received until it is used, if the elapsed time is less than 5 days.

(b) May use the 24-hour (1-day) storage stability test instead of the five-day settlement test.

(c) Make the demulsibility test within 30 days from date of shipment.

(d) Determine distillation by AASHTO T 59,with modifications to include a 350 ± 5EF (177±3EC) maximum temperature to be held for 15 minutes.

(e) CA 332 (California Test Method)

Co-mill latex and asphalt during emulsification

Table 11

Cationic Medium Setting Emulsified Asphalt (CMS-2S)		
Tests	**AASHTO Test Method**	**Specification**
Emulsion		
Viscosity, SF, 122EF (50EC), s	T 59	50 - 450
Percent residue	T 59	60 min
One-day storage stability, percent	T 59	1 max
Sieve, percent	T 59	0.10 max
Particle charge	T 59	Positive
Oil Distillate, percent by volume of emulsion	T 59	5-15
Residue		
Penetration, 77EF (25EC), 100g, 5 sec, dmm	T 59	100-250
Solubility, percent	T 59	97.5 min.

Table 12

High Float Medium Setting Emulsified Asphalt (HFMS-2)			
Tests	**AASHTO Test Method**	**Min.**	**Max.**
Emulsion			
Viscosity, SF, 122°F (50°C), s (Project Site Acceptance/Rejection Limits	T59	70	300
Storage Stability Test, 1d, 24 h, percent	T59		1.0
Sieve Test , percent	T59		0.1
Distillation	T59		
Oil Distillate, by volume of emulsion, percent	T59	NA	NA
Residue, percent	T59	65	
Residue from Distillation Test			
Penetration, 77°F (25°C), 100g, 5 s, dmm	T49	50	200
Float Test, 140°F (60°C), s	T50	1200	
Solubility in Trichloroethylene, percent	T44	97.5	
Ductility, 77°F (25°C) 5cm/min, cm	T51	40	

Table 13

High Float Medium Setting Emulsified Polymerized Asphalt (HFMS-2P) (a)			
Tests	**AASHTO Test method**	**Min.**	**Max.**
Emulsion			
Viscosity, SF, 122EF (50EC), s (Project Site Acceptance/Rejection Limits)	T 59	100	450
Storage Stability Test (a) 1 d, 24 h, percent	T 59		0.1
Sieve Test, percent	T 59		0.1
Distillation			
Oil distillate, by volume of emulsion, percent	T 59	1	7
Residue (c), percent	T 59	65	
Residue from Distillation Test			
Penetration, 77EF (25EC), 100 g, 5 s, dmm	T 49	70	300
Float Test, 140EF (60EC), s	T 50	1200	300
Solubility in trichloroethylene, percent	T 44	97.5	
Elastic Recovery, 77EF (25EC), percent	T 301	50	

(a) Supply an HFMS-2P (anionic, polymerized, high-float) as an emulsified blend of polymerized asphalt cement, water, and emulsifiers. Polymerize the asphalt cement with a minimum of 3.0% polymer by weight of the asphalt cement prior to emulsification. After standing undisturbed for a minimum of 24 hours, the emulsion shall be smooth and homogeneous throughout with no white, milky separation, pumpable, and suitable for application through a distributor.

(b) May use the 24-hour (1-day) storage stability test instead of the five-day settlement test.

(c) Determine the distillation by AASHTO T 59, with modifications to include a 350± 5EF (177±3EC) maximum temperature to be held for 15 minutes.

Table 14

High Float Medium Setting Emulsified Polymerized Asphalt (HFMS-2SP) (a)			
Tests	**AASHTO Test method**	**Min.**	**Max.**
Emulsion			
Viscosity, SF, 122EF (50EC), s (Project Site Acceptance/Rejection Limits)	T 59	50	450
Storage Stability Test (a) 1 d, 24 h, percent	T 59		0.1
Sieve Test, percent	T 59		0.1
Distillation			
Oil distillate, by volume of emulsion, percent	T 59	1	7
Residue (c), percent	T 59	65	
Residue from Distillation Test			
Penetration, 77EF (25EC), 100 g, 5 s, dmm	T 49	150	300
Float Test, 140EF (60EC), s	T 50	1200	
Solubility in trichloroethylene, percent	T 44	97.5	
Elastic Recovery, 77EF (25EC), percent	T 301	50	

(a) Supply an HFMS-2SP (anionic, polymerized, high-float) as an emulsified blend of polymerized asphalt cement, water, and emulsifiers. Polymerize the asphalt cement with a minimum of 3.0% polymer by weight of the asphalt cement prior to emulsification. After standing undisturbed for a minimum of 24 hours, the emulsion shall be smooth and homogeneous throughout with no white, milky separation, pumpable, and suitable for application through a distributor.

(b) May use the 24-hour (1-day) storage stability test instead of the five-day settlement test.

(c) Determine the distillation by AASHTO T 59, with modifications to include a 350± 5EF (177±3EC) maximum temperature to be held for 15 minutes.

Table 15

High Float Rapid Setting Emulsified Polymerized Asphalt (HFRS-2P) (a)			
Tests	**AASHTO Test method**	**Min.**	**Max.**
Emulsion			
Viscosity, SF @ 122EF (50EC), s (Project Site Acceptance/Rejection Limits)	T 59	50	450
Storage Stability Test (b) 1 d, 24 h, percent	T 59		1
Demulsibility 0.02 N Ca Cl_2, percent	T 59	40	
Sieve Test, percent	T 59		0.1
Distillation			
Oil distillate, by volume of emulsion, percent	T 59		3
Residue (c), percent	T 59	65	
Residue from Distillation Test			
Penetration, 77°F (25EC), 100 g, 5 s, dmm	T 49	70	150
Float Test, 140EF (60EC), s	T 50	1200	
Solubility in trichloroethylene, percent	T 44	97.5	
Elastic Recovery, 77EF (25EC), percent	T 301	58	

(a) Supply an HFMS-2SP (anionic, polymerized, high-float) as an emulsified blend of polymerized asphalt cement, water, and emulsifiers. Polymerize the asphalt cement with a minimum of 3.0% polymer by weight of the asphalt cement prior to emulsification. After standing undisturbed for a minimum of 24 hours, the emulsion shall be smooth and homogeneous throughout with no white, milky separation, pumpable, and suitable for application through a distributor.

(b) May use the 24-hour (1-day) storage stability test instead of the five-day settlement test.

(c) Determine the distillation by AASHTO T 59, with modifications to include a 350 ± 5EF (177±3EC) maximum temperature to be held for 15 minutes.

Table 16

Cationic Rapid Setting Emulsified Asphalt (CRS-2A,B)			
Tests	**AASHTO Test Method**	**Min**	**Max**
Emulsion			
Viscosity, SF, 122EF (50EC), s (Project Site Rejection/Acceptance Limits)	T 59	140	400
Storage stability test, 24 h, percent	T 59		1
Demulsibility, 35 mL 0.8 percent Sodium Dioctyl Sulfosucinate, percent	T 59	40	
Particle charge test	T 59	Positive	
Sieve test, percent	T 59		0.10
Distillation			
Oil distillate, by volume of emulsion, percent	T 59		0
Residue, percent	T 59	65	
Use PG58-22 and PG64-22 as base asphalt cement for CRS-2A, B, respectively. Specification for high temperature performance: original and RTFO G*/sin* within 3EC of grade.			

Table 17

Emulsified Type A Asphalt Pavement Rejuvenating Agent Concentrate		
Property	**Test Method**	**Limits**
Viscosity, SF, 77EF (25EC), s	AASHTO T 59	15 Min 40 Max
Residue , percent W (a)	AASHTO T 59	60 Min. 65 Max.
Miscibility Test (b)	AASHTO T-59	No Coagulation
Sieve Test, percent W (c)	AASHTO T 59	0.20 Max.
5-day Settlement, percent W	AASHTO T 59	5.0 Max.
Particle Charge	AASHTO T 59	Positive
Light Transmittance , %	UDOT MOI 8-973	30 Max.
Cement Mixing	AASHTO T-59	2 Max.
Residue from Distillation (a)		
Viscosity, 140 ºF (60EC), mm^2/s	ASTM D 4402	150 - 300
Flash Point, COC, EF (EC)	AASHTO T 48	385 Min.
Asphaltenes, percent W	ASTM D 2006-70	0.4 Min. 0.75 Max.
Maltene Distribution Ratio $(PC + A_1)/(S + A_2)$ (d)	ASTM D 2006-70	0.3 Min. 0.6 Max
Saturated Hydrocarbons, S (d)	ASTM D 2006-70	21 Min. 28 Max.
PC/S Ratio (d)	ASTM D 2006-70	1.5 Min.

(a) AASHTO T 59 , Evaporation Test, modified as follows: Heat a 50 gram sample to 300 ºF until foaming ceases, then cool immediately and calculate results.

(b) AASHTO T 59, modified as follows: use a 0.02 Normal Calcium Chloride solution in place of distilled water.

(c) AASHTO T 59, modified as follows: use distilled water in place of a two percent sodium oleate solution.

(d) Chemical composition by ASTM Method D-2006-70:
PC= Polar Compounds, A_1 = First Acidaffins
A_2 = Second Acidaffins, S = Saturated Hydrocarbons

Table 18

Emulsified Type B Asphalt Pavement Rejuvenating Agent Concentrate		
Tests	**Test Method**	**Limits**
Viscosity, SF, 77EF (25EC), s	AASHTO T 59	25-150
Residue, percent W	AASHTO T 59 (mod) (a)	62 Min.
Sieve Test, percent W	AASHTO T 59	0.10 Max.
5-day Settlement	AASHTO T 59	5.0 Max.
Particle Charge	AASHTO T 59	Positive
Pumping Stability (b)		Pass
Residue from Distillation (a)		
Viscosity @ 140°F (60°C), mm^2/s	AASHTO T 201	2500-7500
Solubility in 1,1,1 Trichloroethylene, percent	AASHTO T 44	98 Min.
Flash Point, COC	ASTM D 92	204EC, Min.
Asphaltenes, percent W	ASTM D 2007	15 Max.
Saturates, percent W	ASTM D 2007	30 Max.
Aromatics, percent W	ASTM D 2007	25 Min.
Polar Compounds, percent W	ASTM D 2007	25 Min.
(a) Determine the distillation by AASHTO T 59 with modifications to include a 300 ±5EF (149±3EC) maximum temperature to be held for 15 minutes.		
(b) Test pumping stability by pumping 475 ml of Type B diluted 1 part concentrate to 1 part water, at 77EF (25°C) through a 1/4 inch gear pump operating at 1750 rpm for 10 minutes with no significant separation or coagulation in pumped material.		
Type B: an emulsified blend of, lube oil and/or lube oil extract, and petroleum asphalt.		

Table 19

Emulsified Type B Modified Asphalt Pavement Rejuvenating Agent Concentrate		
Property	**Test Method**	**Limits**
Viscosity, SF, 77EF (25EC), s	AASHTO T 59	50-200
Residue by distillation or Evaporation (a), percent W	AASHTO T 59	62 Min.
Sieve Test, percent W	AASHTO T 59	0.20 Max.
5-day Settlement, percent W	AASHTO T 59	5.0 Max.
Particle Charge	AASHTO T 59	Positive
Pumping Stability (b)		Pass
Residue from Distillation (a)		
Viscosity (c) 275EF (135EC), cP	ASTM D 4402	150 - 300
Penetration, 77EF (25EC), dmm	AASHTO T 49	180 Min.
Solubility in 1,1,1 Trichloroethylene, percent	AASHTO T 44	98 Min.
Flash Point, COC, EF (EC)	AASHTO T 48	400(204) Min.
Asphaltenes, percent W	ASTM D 2007	20-40
Saturates, percent % W	ASTM D 2007	20 Max.
Polar Compounds, percent W	ASTM D 2007	25 Min.
Aromatics, percent W	ASTM D 2007	20 Min.
PC/S Ratio	ASTM D 2007	1.5 Min.
(a) Determine the distillation by AASHTO T 59 with modifications to include a 300±5EF (149± 3°C) maximum temperature to be held for 15 minutes. (b) Pumping stability is tested by pumping 475 ml of Type B diluted 1 part concentrate to 1 part water, at 77EF (25EC) through a 1/4 inch gear pump operating at 1750 rpm for 10 minutes with no significant separation or coagulation in pumped material. (c) Brookfield Thermocel Apparatus-LV model. ≥ 50 rpm with a #21 spindle, 7.1 g residue, at > 10 torque		
As required by the Asphalt Emulsion Quality Management Plan, UDOT Minimum Sampling and Testing Guide, Section 508) the supplier certifies that the base stock contains a minimum of 15% by weight of Gilsonite Ore. Use the HCL precipitation method as a qualitative test to detect the presence of Gilsonite.		

Table 20

Emulsified Type C Asphalt Pavement Rejuvenating Agent Concentrate		
Property	**Test Method**	**Limits**
Viscosity, SF, 77EF (25EC), s	AASHTO T 59	10-100
Residue (a), percent W (Type C supplied ready to use 1:1 or 2:1.	AASHTO T 59 (a)	30 Min. 1:1 40 Min. 2:1
Sieve Test, percent W (b)		0.10 Max.
5-day Settlement, percent W	AASHTO T 59	5.0 Max.
Particle Charge	AASHTO T 59	Positive
pH (May be used if particle charge test is inconclusive)		2.0 - 7.0
Pumping Stability (c)		Pass
Tests of Residue from Distillation (a)		
Viscosity, 275EF (135°C), mm^2/s	AASHTO T 201	475-1500
Solubility in 1,1,1 Trichloroethylene, percent	AASHTO T 44	97.5 Min.
RTFO mass loss, percent W	AASHTO T 240	2.5 Max.
Specific Gravity	AASHTO T 228	0.98 Min.
Flash Point, COC	AASHTO T 48	232 EC, Min.
Asphaltenes, percent W	ASTM D 2007	25 Min., 45 Max.
Saturates, percent W	ASTM D 2007	10 Max.
Polar Compounds, percent W	ASTM D 2007	30 Min.
Aromatics, percent W	ASTM D 2007	15 Min.

(a) Determine the distillation by AASHTO T 59 with modifications to include a 300± 5EF (149 ± 3EC) maximum temperature to be held for 15 minutes.

(b) Test method identical to AASHTO T 59 except that distilled water is used in place of 2 % sodium oleate solution.

(c) Test pumping stability by pumping 475 ml of Type diluted 1 part concentrate to 1 part water, at 77EF (25EC) through a 1/4 inch gear pump operating at 1750 rpm for 10 minutes with no significant separation or coagulation in pumped material.

As required by the Asphalt Emulsion Quality Management Plan, UDOT Minimum Sampling and Testing Guide, Section 508), the supplier certifies that the base stock contains a minimum of 10% by weight of Gilsonite ore. Use the HCL precipitation method as a qualitative test to detect the presence of Gilsonite.

Table 21

Emulsified Type D Asphalt Pavement Rejuvenating Agent Concentrate		
Property	**Test Method**	**Limits**
Viscosity, SF, 77EF (25EC), s	AASHTO T 59	30-90
Residue, (a) percent W	AASHTO T 59 (mod) (a)	65
Sieve Test, percent W	AASHTO T 59	0.10 Max.
pH		2.0 - 5.0
Residue from Distillation (c)		
Viscosity, 140EF (60EC), cm^2/s	AASHTO T 201	300-1200
Viscosity, 275EF (135EC), mm^2/s	AASHTO T 201	300 Min.
Modified Torsional Recovery (b)	CA 332 (Mod)	40 % Min.
Toughness, 77EF (25EC), in-lb	ASTM D 5801	8 Min.
Tenacity, 77EF (25EC), in-lb	ASTM D 5801	5.3 Min.
Asphaltenes, percent W	ASTM D 2007	16 Max.
Saturates, percent W	ASTM D 2007	20 Max.

(a) California test method #331 for recovery of residue.
(b) Torsional recovery measurement to include first 30 seconds.
(c) Determine the distillation by AASHTO T 59 with modifications to include a 300±5EF (149±3EC) maximum temperature to be held for 15 minutes.

2.3 HOT-POUR CRACK SEALANT FOR BITUMINOUS CONCRETE

A. Combine a homogenous blend of materials to produce a sealant meeting properties and tests in Table 22

B. Packaging and Marking: Supply sealant pre-blended, pre-reacted, and pre-packaged in lined boxes weighing no more than 30 lb.
   1. Use a dissolvable lining that will completely melt and become part of the sealant upon subsequent re-melting.
   2. Deliver the sealant in the manufacturer's original sealed container. Clearly mark each container with the manufacturer's name, trade name of sealant, batch or lot number, and recommended safe heating and application temperatures.

Table 22

Hot-Pour Bituminous Concrete Crack Sealant			
Application Properties:			
Workability:	Pour readily and penetrate 0.25 inch and wider cracks for the entire application temperature range recommended by the manufacturer.		
Curing:	No tracking caused by normal traffic after 45 minutes from application.		
Asphalt Compatibility: ASTM D 5329, Section 14.	No failure in adhesion. No formation of an oily ooze at the interface between the sealant and the bituminous concrete or softening or other harmful effects on the bituminous concrete.		
Material Handling:	Follow the manufacturer's safe heating and application temperatures.		
Test Method	**Property**	**Minimum**	**Maximum**
AASHTO T 51	Ductility, modified, 1cm/min, 39.2EF (4EC), cm	30	
UDOT method 967	Cold Temperature Flexibility	no cracks	
AASHTO T 300 (a)	Force-Ductility, lb force		4
ASTM D 5329	Flow 140EF (60EC), 5 hrs 75Eangle, mm		3
ASTM D 3405 (b)	Tensile-Adhesion, modified	300%	
AASHTO T 228	Specific Gravity, 60EF (15.6EC)		1.140
ASTM D 5329	Cone Penetration, 77EF (25EC), 150 g, 5 sec., dmm		90
ASTM D 5329	Resilience, 77EF (25EC), 20 sec., percent	30	
ASTM D 4402	Viscosity, 380EF (193.3EC), SC4-27 spindle, 20 rpm, cP		2500
ASTM D 5329	Bond as per ASTM D 1190, Section 6.4		Pass

(a) Maximum of 4 lb force during the specified elongation of 30 cm @ 1 cm/min, 39.2EF (4EC).

(b) Use ASTM D 3405, Section 6.4.1. Delete bond and substitute tensile-adhesion test in accordance to D 5329.

PART 3 EXECUTION Not used

END OF SECTION

April 14, 2005

SPECIAL PROVISION

SP -9999(750)

SECTION 02768M

PAVEMENT MARKING MATERIALS

(Warranty Specification)

Delete section 1.3 B. Warranty Bond

Supplemental Specification
2005 Standard Specification Book

SECTION 02843

CRASH CUSHIONS

Delete Section 02843 and replace with the following:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Furnish and install crash cushions

B. Furnish and install crash cushion markings

1.2 RELATED SECTION

A. Section 02324: Compaction

1.3 REFERENCES

A. ASTM D 4956: Standard Specification for Retroreflective Sheeting for Traffic Control

B. NCHRP Report 350: Recommended Procedures for the Safety Performance Evaluation of Highway Features

C. UDOT Guidelines for Crash Cushions and Barrier End Treatments, current edition

1.4 SUBMITTALS

A. Installer Certification.
   1. Manufacturer certified installer.
   2. Provide proof of certification prior to installation.

B. Provide a letter of certification for each system location, affirming that each system is installed according to Department's and the manufacturer's specifications.
   1. Reference Project Number and describe Station/location indicating median, left or right shoulder or gore area application.

PART 2 PRODUCTS

2.1 CRASH CUSHION

A. Select from the current approved products list, UDOT Guidelines for Crash Cushions and Barrier End Treatments.
   1. Refer to the current UDOT Guidelines for Crash Cushions and Barrier End Treatments for specific uses and requirements for each approved system type. The UDOT Guidelines for Crash Cushion and Barrier End Treatments and Barrier End Treatments is maintained by the Division of Traffic and Safety and available through the UDOT Internet home page. Refer to http://www.udot.utah.gov/index.php/m=c/tid=719.
      a. Systems tested under NCHRP-350 requirements and a letter of acceptance issued by FHWA.
      b. Supply three sets of shop drawings and installation drawings for each system type supplied.
         1) Distribute drawings to Contractor, installation contractor, and Engineer or designated representative.
   2. Refer to CC series Standard Drawings for each approved system type.

B. Types:
   1. Type A: Protect fixed hazards greater than 3 ft wide within 15 ft of traveled way, with less than 100 ft of longitudinal space in front of the hazard.
      a. Supply system(s) with an adequate width as specified in plan set.
      b. Supply system(s) as per manufacturer's requirements for design speed as specified in plan set.
         1) Supply the minimum NCHRP-350 Test Level 3 system for roadways greater than 55 MPH.
      c. Galvanize all steel parts as per manufacturer's requirements.
      d. Supply transition element, for the approach of opposing traffic, when system is installed with bi-directional traffic and the system is within 1.2 times the required minimum clear zone.
         1) Two transition elements required when system is installed with w-beam median barrier.
      e. Install system on concrete pad as per manufacturer's requirements.
      f. Supply crash cushion markings as per CC series Standard Drawings.

2. Type B: To protect fixed hazards up to 3 ft wide or less and within 15 ft of traveled way, with less than 100 ft of longitudinal space in front of the hazard.
    a. Supply system with an adequate width as specified in plan set.
    b. Supply system as per manufacturer's requirements for design speed as specified in plan set.
        1) Supply the minimum NCHRP-350 Test Level 3 system for roadways greater than 55 MPH.
    c. Galvanize all steel parts as per manufacturer's requirements.
    d. Supply transition element, for the approach of opposing traffic, when system is installed with bi-directional traffic and the system is within 1.2 times the required minimum clear zone.
        1) Two transition elements required when system is installed with w-beam median barrier.
    e. Install system on concrete pad as per manufacturer's requirements.
    f. Supply crash cushion markings as per CC series Standard Drawings.
3. Type C: To protect fixed objects 3 ft wide or less within 15 ft of traveled way, and longitudinal space in front of the hazard greater than 100 ft.
    a. Galvanize all steel parts as per manufacturer's requirements.
    b. Supply double-sided w-beam transition element when system is installed in conjunction with concrete barrier or bridge parapet.
    c. Supply crash cushion markings as per CC series Standard Drawings.
4. Type D: To protect fixed hazards within 15 ft of traveled way. Use in areas where one impact per year is anticipated or when repair history indicates two or more impacts over a three-year period.
    a. Supply system with an adequate width as specified in plan set.
    b. Supply system as per manufacturer's requirements for design speed as specified in plan set.
    c. Supply the minimum NCHRP-350 Test Level 3 system for roadways greater than 55 MPH.
    d. Galvanize all steel parts as per manufacturer's requirements.
    e. Supply transition element, for the approach of opposing traffic, when system is installed with bi-directional traffic and the system is within 1.2 times the required minimum clear zone.
        1) Two transition elements required when system is installed with w-beam median barrier.
    f. Install system on concrete pad as per manufacturer's requirements.
    g. Supply crash cushion markings as per CC series Standard Drawings.

5. Type E - Sand Barrel Arrays: To protect fixed hazards outside of 15 ft from the traveled way and there is an unlimited amount of space. Refer to the UDOT Guidelines for Crash Cushion and Barrier End Treatments for specific uses and requirements of sand barrel arrays.
    a. Design sand barrel array using Energite® III/Fitch® Universal Module Systems design manual.
    b. Certify sand barrels and components meet NCHRP-350 for nonredirective, gating crash cushions.
    c. Sand barrels will be constructed using a frangible polyethylene material, which will shatter upon impact.
        1) Use yellow sand barrels.
        2) Permanently apply manufactured date, month, and year to each piece of the barrel system.
        3) Use one or two-piece barrel construction.
        4) Interface cones with the barrel to prevent leakage of sand but allow for the drainage of excess water for sand barrel systems that use barrel and cone configuration.
        5) Provide lids for each sand barrel. Fasten lid securely to barrel.
    d. Provide sand barrels that hold the required amounts of sand as per requirements of the typical sand barrel array.
        1) 200 lbs., 400 lbs, 700 lbs., 1400 lbs, and 2100 lbs.
        2) Mark each barrel in a manner that the amount of sand required for the nominal weight is visible for systems that are designed using barrels for multiple sand weight requirements.
    e. Use dry sand to fill modules, 2 percent or less moisture.
    f. Supply crash cushion markings and construct pad as per CC series Standard Drawings.
6. Type F: Use to protect concrete barrier or bridge parapets with less than 150 ft of longitudinal space in front of the hazard. Used in a unidirectional application.
    a. Galvanize all steel parts as per manufacturer's requirements.
    b. Install system on concrete pad, when specified by manufacturer, and to the manufacturer's specifications.
    c. Supply crash cushion markings as per CC series Standard Drawings.
7. Type G: Use to protect the approach end of single face w-beam guardrail or approach ends of bridge parapet and concrete barrier with unlimited longitudinal space (greater than 125 ft) in front of the hazard in a unidirectional application, and is installed where a tangent system is desired. W-beam transition element is required when system is installed at the end of bridge parapet or the end of concrete barrier.
    a. Supply one of the approved post options as described in UDOT Guidelines for Crash Cushion and Barrier End Treatments.

b. Supply system with 12-½ ft galvanized w-beam rail elements as per manufacturer's requirements.
c. Supply manufacturer approved impact head and hardware.
d. Galvanize all steel parts as per manufacturer's requirements.
e. Supply crash cushion markings as per CC series Standard Drawings.

8. Type H: Use to protect the approach end of single face w-beam guardrail or approach end of bridge parapet and concrete barrier with unlimited longitudinal space (greater than 125 ft) in front of the hazard in a unidirectional application, and is installed where a flared system is desired. W-beam transition element is required when system is installed at the end of a bridge parapet or the end of concrete barrier.
   a. Supply one of the approved post options as described in UDOT Guidelines for Crash Cushion and Barrier End Treatments.
   b. Supply system with 12-½ ft galvanized w-beam rail elements as per to manufacturer's requirements.
   c. Supply manufacturer approved impact head or end section and hardware.
   d. Galvanize all steel parts as per manufacturer's requirements.
   e. Supply crash cushion markings as per CC series Standard Drawings.

2.2 CRASH CUSHION MARKINGS

A. Marker plate: Per CC series Standard Drawings.
   1. Construct marker plate 18 inches x 18 inches using 0.032-gage aluminum with appropriate object marker sheeting.
      a. Drill a 7/16-inch hole in each corner of plate.
      b. Use ASTM D 4956 Type III sheeting with encapsulated glass bead retroreflective material, or greater. Use appropriate sheeting type for the substrate sheeting is placed on.
      c. Use a 24 inch x 14 inch object marker plate or self-adhesive object marker sheeting ASTM D 4956 Type III sheeting with encapsulated glass bead retroreflective material, or greater for Type C systems. Use appropriate sheeting type for the substrate sheeting is placed on.
      d. Substitution of self-adhesive object marker sheeting ASTM D 4956 Type III sheeting with encapsulated glass bead retroreflective material, or greater, 18 inches x 18 inches or 24 inches x 14 inches placed directly on system for Marker Plate is acceptable.
      e. Accept object markers supplied by the manufacturer that exceed the above requirements.

B. Marker Post: Per CC series Standard Drawings
   1. Construct marker post, 60 inches long and 2 inches OD, using black polyethylene material.
      a. Close top of marker post.
      b. Drill three 7/16-inch mounting holes.
      c. Apply three 4-inch bands of yellow sheeting ASTM D 4956 Type III sheeting with encapsulated glass bead retroreflective material, or greater.

PART 3 EXECUTION

3.1 INSTALLATION

A. Prepare site to finished grade prior to installation of crash cushion or barrier end treatment.
   1. Construct approach areas and recovery areas to meet UDOT Standards and system requirements prior to installation of system.
      a. Refer to CC series Standard Drawings for system requirements.
   2. Construct concrete pad, when applicable, to meet system requirements.
      a. Use manufactures specification for concrete pad construction.
      b. Refer to CC series Standard Drawings for Type E - sand barrel detail, for pad requirements.
   3. Obtain Engineer's approval of site grading, approach and recovery areas, and layout, prior to system installation.
   4. Compact backfill material around posts and foundation tubes to minimum 96 percent of maximum laboratory density and dispose of excess material. Refer to Section 02324.

B. Install in accordance with:
   1. UDOT Guidelines for Crash Cushion and Barrier End Treatments.
   2. Manufacturer's specifications and recommendations.
   3. Use manufacturer certified installer to perform the installation.

C. Complete repair or replacement of any crash cushion damaged during construction within 24 hours of notification of damage.

1. Contractor is responsible for the cost of repair or replacement of any permanent system damaged for any reason until final acceptance.
    a. Exception:
        1) Damage is caused by an errant vehicle, AND
        2) Damage occurs after Traffic has been established in the final lane configuration with shoulders as established in the project plans.
    b. Payment will be made using a Force Account basis for the cost of repair or replacement of the damaged system when the Engineer determines the conditions described under the exception above apply.

END OF SECTION

November 23, 2004

SPECIAL PROVISION

SP-9999(750)

SECTION 03371S

THIN BONDED POLYMER OVERLAYS FOR BRIDGE DECKS AND APPROACH SLABS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials and procedures for applying a protective crack treatment and bridge deck overlay using either an epoxy-urethane polymer (**Type 1**), or a Modified Epoxy polymer (**Type 2**) with a broadcast aggregate wearing surface.

1.2 REFERENCES

A.	ACI – 503R:	Adhesion to Concrete, Pull Out Test
B.	ASTM C-109:	Compressive Strength of Hydraulic Cement Mortars
C.	ASTM C-501:	Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abrader
D.	ASTM C-566:	Aggregate Testing
E.	ASTM C-778:	Sampling
F.	ASTM D-570:	Water Absorption of Plastics
G.	ASTM D-638:	Tensile Stress and Load Bearing Capacity
H.	ASTM D-790:	Flexural Yield Strength
I.	ASTM D-971:	Surface Tension
J.	ASTM D-2240:	Rubber Property – Durometer Hardness
K.	ASTM 4065-95:	Dynamic Mechanical Analysis

L. NCHRP 244: Chloride Penetration Test Method

M. Mohs Scale Hardness Test

N. Sieve Analysis: Aggregate Gradation

O. California Test Method 419: Flexural Creep

1.3 SUBMITTALS

A. Submit the intended name of the manufacturer of the Polymer Overlay materials at the Pre-Construction Meeting.

B. Submit to the ENGINEER for approval (at least 10 days prior to placement) a Certificate of Compliance from an independent nationally recognized laboratory stating that the polymer overlay materials meet the requirements listed in Tables 1, 2, 3, 4, 5 and other material requirements contained in this specification.

C. Submit a name and phone number of the Manufacturer's Technical Support Representative at the Preconstruction Meeting.

PART 2 PRODUCTS

2.1 POLYMER OVERLAY MATERIALS

A. Install an **Thin Bonded Polymer bridge deck overlay system using either an Epoxy-Urethane (Type 1) co-polymer, or modified Epoxy (Type 2) polymer as specified on the plan or detail sheets**, which includes all materials, surface preparation, application of a pretreatment for crack filling and bonding, and two (2) coats of a polymer resin broadcast with a high wear, high skid aggregate that chemically cures to provide an impervious wearing surface.

Type 1 – Epoxy-Urethane Co-Polymer: Provide Polymer resins consisting of a blend of epoxy and urethane materials that meet the physical requirements outlined in other parts of this specification. The polymer overlay is to be free of any fillers, volatile solvents and the use of external/conventional flexiblizers is not permitted. The use of metered mixing equipment, as outlined in other parts of this specification is required with the use of this material. In general, the use of a Type 1 polymer (with equipment) is intended for high wear conditions, and rapid construction schedules, and is acceptable for use on all bridge deck environments.

Type 2 – Modified Epoxy Polymer: Provide Polymer resins consisting of modified epoxy materials that meet the physical requirements outlined in other parts of this specification. The use of additives, fillers, volatile solvents, and flexiblizers to modify the physical properties of the epoxy to meet physical requirements are acceptable. The use of metered mixing equipment, as outlined in other parts of this specification is **NOT** required with the use of this material, but is highly recommended. In general, the use of a Type 2 polymer should be limited to low wear conditions, and moderate construction schedules. For projects specifying a Type 2 (Modified Epoxy) polymer, a Type 1 (epoxy-urethane) polymer may be substituted for the Type 2 polymer.

2.2 STEEL SHOT BLAST

A. Clean concrete surfaces using a Steel Shot Blast in accordance with the recommendations of the polymer overlay manufacturer.

2.3 PRETREATMENT AND CRACK FILLER

A. After cleaning the concrete surface, apply a two (2) component pretreatment to the bridge deck to fill minor cracks and increase the bond strength between the overlay and the deck surface. Pretreatment to comply with the physical properties of TABLE 1:

TABLE 1
PHYSICAL PROPERTIES OF THE PRETREATMENT SYSTEM

Property	Value
Compressive Strength, min. psi	5,500 – 6,000
Tensile Strength, min. psi	3,100 – 3,400
Tensile Elongation, percent min.	35 $\pm$5
Water Absorption, percent by wt. Max.	<0.10
Shore D Hardness, 77°F min.	70 $\pm$5
Gel Time, minutes	48-52 (7 oz.)
Adhesion to Concrete	100% failure in concrete
Surface tension	Less than 0.0012 pounds/in^3
Percent Solids	100

2.4 POLYMER OVERLAY SYSTEM

A. After applying the pretreatment, apply two (2) layers of a two-part polymer resin and saturate it with a broadcast aggregate before it cures. They polymer is to be formulated to volumetric mixing proportions (such as 1 part A to 1 part B), according to the manufacturer's recommendations. The cured polymer system is to comply with the physical requirements of TABLE 2.

TABLE 2
PHYSICAL PROPERTIES OF THE POLYMER OVERLAY SYSTEM

Property	Value
Compressive Strength, min. psi	7,000
Tensile Strength, min. psi	2,500
Tensile Elongation, percent min.	35 $\pm$5
Water Absorption, percent by wt. Max.	0.20
Shore D Hardness, 77°F min.	65 $\pm$5
Gel Time, minutes	22-31
Abrasion Resistance, oz., max.	0.003
Adhesion to Concrete	100% failure in concrete
Flexural Creep: Total Movement in 7 days	.0065 inches minimum
Flexural Yield Strength, min. psi	5,000
Percent Solids	100

B. The modulus of the cured polymer system is to comply with the requirements of TABLE 3, using a variable temperature Dynamic Mechanical Analysis (DMA) at a frequency of 1 HZ with a 0.3% strain using ASTM D-4065-95.

C. The cured epoxy-urethane system is to conform to a load bearing capacity of retaining 85% of its original load bearing strength at (tensile strength) as 20% strain using ASTM method D-638.

TABLE 3
VISCO-ELASTIC PROPERTIES OF THE POLYMER OVERLAY SYSTEM

TEMPERATURE	STORAGE MODULUS pounds/in^2	LOSS MODULUS Pounds/in^2
14°F	$1.45X10^5$	$8.70X10^3$
68°F	$1.01X10^5$	$1.30X10^4$
122°F	$5.80X10^3$	$4.35X10^3$
140°F	$1.45X10^3$	$1.01X10^3$
158°F	$8.70X10^2$	$2.90X10^2$

2.5 AGGREGATE

A. An aggregate wearing surface is to be broadcast into the polymer system according to the manufacturer's specifications. The aggregate used is to be non-friable, non-polishing, clean and free of surface moisture. It should have a proven record of durability in this type of application. 100% of the aggregate is to have at least 1 mechanically fractured face for materials being retained on the #10 sieve. The aggregate is to be thoroughly washed, kiln dried to maximum moisture content of 0.2% by weight (ASTM C-566). The recommended aggregate is Washington Stone. Alternate aggregates may be allowed upon approval by the manufacturer and ENGINEER.

B. The aggregate is to meet the physical properties of TABLE 4 and TABLE 5:

TABLE 4
AGGREGATE PROPERTIES

GLACIAL GRAVEL	BASALT QUARTZITE GRANITE (% by Weight)
$Si0_2$	75.03
Al_2O_3	11.49
Fe_2O_3	3.57
CaO	2.84
MgO	1.59
SO_3	0.08
Na_2O	2.58
K_2O	0.99
Combined Alkali	3.20
Ignition Loss	1.72
Mohs Scale Hardness	6.50
ASTM 566 (water absorption)	0.2%

TABLE 5
AGGREGATE GRADATION

Sieve Size	Percent Passing
0.187 in; No.6	100
0.078 in; No.10	10 – 35
0.033 in; No.20	0 – 10

PART 3 EXECUTION

3.1 SURFACE PREPARATION

A. Pot-Hole Patching: Repair any minor potholes of the surface area of the deck prior to installation of the polymer system using cementious patching materials that meet other specifications. The use of polymer patching materials will be allowed for potholes less than 1 inch in depth, and in accordance with the recommendations of the manufacturer and the ENGINEER. Any costs associated with the surface defects and pothole repairs less than 1 inch in depth are to be included in with the Bid Item for the Polymer Overlay System.

B. Shot-Blasting: The entire deck is to be cleaned by steel shot-blasting to remove any oil, dirt, rubber or other materials that, in the opinion of the manufacturer or ENGINEER, may be detrimental to the bonding and curing of the polymer overlay.

C. Curbs: In areas that cannot be reached with the steel shot-blasting, such as curbs, sandblasting equipment or mechanical grinders are permitted with the approval of the manufacturer or ENGINEER.

D. Traffic: Traffic is not to be allowed on any portion of the deck, which has been shot-blasted. The overlay equipment will be allowed on cleaned surfaces under the supervision of the Manufacturer and Engineer.

E. Weather: All surfaces to be treated are to be dry at the time of application. The polymer overlay system is not to be applied when it has rained within 24 hours, or is expected to rain within 8 hours. Moisture content in the concrete substrate is not be exceed 4.5% when measured by an electronic meter. The minimum recommended temperature is 50°F and increasing. The polymer overlays are not to be applied before April 15th, or after September 30th, unless approved by the Engineer.

3.2 APPLICATION

A. Sound Surface: The application of the pretreatment and Polymer Overlay Systems are to be on a structurally sound concrete surface and in accordance with the manufacturer's specifications.

B. Metered Mixing Equipment: For Type 1 Polymers, the use of special equipment is required that is capable of metering, mixing and distributing the polymer. The machinery must be owned and operated, or approved by the polymer manufacturer. The application machine shall feature positive displacement volumetric metering pumps controlled by a hydraulic power unit. Components shall be stored in temperature controlled reservoirs capable of maintaining 100° $\pm$10°F to insure optimum mixing. Ratio check verification at the pump outlets as well as cycle counting capabilities to monitor output will be standard features. In line mixing shall be motionless so as to not overly shear the material or entrap air in the mix. The machine shall maximize working time of the material by mixing it immediately prior to dispensing.

C. Layer Thickness: The number of layers and the application rates of the liquid in the various layers shall be as recommended by the manufacturer in order to achieve a minimum overlay thickness of 0.375 in.

D. First Layer:

1. Application of the Liquid: After manually or mechanically measuring and mixing of the components, the liquid shall be evenly distributed on the clean, dry deck surface at the rate as recommended by the manufacturer. After the entire deck surface is wet, allow 1-2 hours for the liquid to achieve full depth penetration into cracks as well as adequately encapsulate the steel grid, if any. After the liquid is allowed to penetrate, medium size coarse silica sand may be broadcast evenly if the subsequent application is going to be applied after 8-12 hours.

E. Second Layer: Prior to the application, if there exists any excess or loose aggregate from the previous coat, such excess aggregate shall be completely removed by vacuum or with compressed air. After mixing of the components via the mechanical application equipment, the liquid shall be evenly distributed on the clean, dry deck surface at the rate as recommended by the manufacturer.

F. Time Limits For Aggregate: After the application of the liquid in the first and second coats, the maximum time allowed before broadcasting of the aggregate is as follows:

Above 90°F	10 minutes
80°F to 90°F	15 minutes
70°F to 80°F	20 minutes
60°F to 70°F	25 minutes
50°F to 60°F	35 minutes

G. Broadcasting Aggregate: Broadcasting on decks shall be by truck-mounted equipment capable of dispensing the aggregate onto the deck in a uniform manner as directed or otherwise approved by the manufacturer. The aggregate shall be broadcast such that to cover the surface so that no wet spots appear and before the polymer begins to gel. The aggregate must be dropped vertically in such a manner that the level of the liquid is not disturbed. In the first and second layers of the liquid, aggregate conforming to TABLES 4 and 5 of this specification shall be broadcast to saturate until no wet spots remain.

H. Removal Of Excess Aggregate: After the overlay has hardened, removal of all loose and excess aggregate with a power vacuum or other method shall be made prior to the application of subsequent coats.

I. Longitudinal Joints In The Overlay: (i.e., between two adjacent lanes) shall be staggered and overlapped between successive coats so that no ridges will appear.

J. Traffic: Traffic may be allowed on the final layer, or in between layers after the resin has cured (as determined by the manufacturer) and after removal of all excess, loose aggregate.

K. Storage And Handling, Liquid Material: All material shall be transported and stored in their original containers inside a dry, temperature controlled facility and maintained at a minimum temperature of 60°F to 90°F.

L. Job Site Storage: The materials shall be stored on the job site in a dry, weather protected facility away from moisture and within the temperature range of 60°F to 90°F. When the materials are transported or stored on the job, in the application machine tanks, the material must also be maintained at a temperature of 60°F to 90°F.

M. Handling Of Liquid Materials On The Job: Protective gloves, clothing, boots and goggles shall be provided to workers and inspectors directly exposed to the material. Product safety data sheets shall be provided to all workers and inspectors as obtained from the manufacturer.

N. Aggregate: All aggregate shall be stored in a dry, moisture-free atmosphere. The aggregate shall be full protected from any contaminants on the job site and shall be stored so as not be exposed to rain or other moisture sources.

3.3 QUALITY CONTROL

A. Technical Support Representative: The manufacturer shall have a representative on the job site at all times who, upon consultation with the ENGINEER, may suspend any item of work that is suspect and does not meet the requirements of this specification. Resumption of work will occur only after the manufacturer's representative and the ENGINEER are satisfied that appropriate remedial action has been taken by the CONTRACTOR.

B. Warranty: The polymer manufacturer and the CONTRACTOR shall jointly guarantee the wearing surface against all defects incurred during normal traffic for a **period of three (3) years**, for any delamination or reduced skid (less than 50). The guarantee period shall commence on the date of acceptance of work (typically the date traffic is allowed on surface),

C. Samples: The manufacturer shall furnish at least one-quart sample of each component from each lot to the DOT laboratory to verify material supplied.

D. Prior Performance: The selected material must have a satisfactory performance in Utah for at least 2-years from the time of placement. Products without 2 years of satisfactory prior performance will be considered as experimental, should not be used for bidding purposes, and will only be considered for use with the approval of the ENGINEER, after the award of the contract.

E. Packing Requirement: All materials must be packed in strong, substantial containers. The containers shall be identified as Part A and Part B and shall be plainly marked with the name and address of the manufacturer, name of the product, mixing proportions and instructions, lot and batch numbers, date of manufacture and quantity contained therein.

F. Material Quality Control And Testing Methods: The materials used shall meet the properties specified in the tables and other sections of this specification, and shall also meet the following correspondence tests for quality control:

1. Compressive Strength: ASTM C-109, *Compressive Strength of Hydraulic Cement Mortars*. The two components of the resin are to be thoroughly mixed in their appropriate ratios. Two volumes of graded silica sand in accordance with ASTM C-778 shall be added to one volume of mixed resin. The samples shall then be prepared according to the requirements of ASTM C-109 and allowed to cure for 7 days at 73° $\pm$4°F.

2. Tensile Strength and Elongation: ASTM D-638, *Tensile Properties of Plastics*, Specimen Type I or Type II. Samples shall be cured at 73° ±4°F and 50 ±5% relative humidity. Speed of testing shall be 0.5 in./min.

3. Water Absorption: ASTM D-570, *Water Absorption of Plastics*. Sample specimens shall be prepared according to Section 4.1 and allowed to cure at 73° ±4°F and 50 ±5% relative humidity. Tests are then to be carried out as per Section 6.1.

4. Shore D Hardness: ASTM D-2240, *Rubber Property – Durometer Hardness*. Specimen shall be prepared as per ASTM D-570 Section 4.1 and allowed to cure at 73 ±4°F.

5. Gel Time: The following procedure shall be used to determine gel time:
   Measure 4 oz. of Part A and 2 oz. of Part B each at 77°F, into an unwaxed paper cup and record the time and mix immediately. 3.5 oz. of this mixture shall be poured into a 6 oz. unwaxed paper cup and placed on a wooden bench top. Starting twenty (20) minutes from the time recorded above, the mixture shall be probed every two (2) minutes with a small stick until a small ball forms in the center of the container. The total time, including mixing, required for the ball to form shall be regarded as the gel time. The test shall be performed in a room or enclosed area maintained at 77° ±4°F and 50 ±5% relative humidity.

6. Abrasion Resistance: ASTM C-501, *Test Method for Relative Resistance to Wear of Unglazed Ceramic Tile by the Taber Abrader*. Tests shall be done using a CS-17 wheel and a 2.2 pound load for 1,000 cycles.

7. Adhesion to Concrete: ACI-503-R, Pull Out Test.

8. Flexural Creep: California Test Method 419.

9. Flexural Yield Strength: ASTM D-790.

10. Surface Tension: ASTM D-971.

END OF SECTION

April 1, 2005

SPECIAL PROVISION

SP-9999(750)

SECTION 03381S

CLEAR PENETRATING CONCRETE SEALER FOR BRIDGES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Materials and procedures for applying protective penetrating concrete sealers (**vinyl toluene acrylic silane polymer**) on bridge parapets, outside face of exterior beam, bent caps and column concrete surfaces.

1.2 REFERENCES

A. AASHTO T 260: Sampling and Testing for Total Chloride Ion in Concrete and Concrete Raw Materials.

B. ASTM C 267: Chemical Resistance of Mortars, Grouts, and Monolithic Surfacing and Polymer Concretes.

C. ASTM C 666: Resistance of Concrete to Rapid Freezing and Thawing.

D. ASTM E 274: Skid Resistance of Paved Surfaces Using a Full-Scale Tire.

1.3 SUBMITTALS

A. Certificate of Compliance to the ENGINEER or the Construction and Materials Division.

B. One liter of the product to the ENGINEER for each lot of material

C. Material Safety Data Sheets (MSDS).

D. Each container shall be clearly marked with lot numbers, date of manufacture, pertinent safety and handling information, and emergency contact phone numbers.

PART 2 PRODUCTS

2.1 PENETRATING CONCRETE SEALERS

A. Vinyl toluene acrylic silane polymer blend penetrating sealant for concrete surfaces. Substitution of the alktrialkoxy film forming silane by silicones or siloxanes will not be permitted.

B. Slight color dies are allowed for application purposes, with clear appearance within 7 days of application.

C. Comply with Federal VOC requirements.

D. Comply with requirements of Table 1:

Table 1

Penetrating Concrete Sealer Requirements				
*** Properties**	**Requirements**	**ASTM**	**AASHTO**	**** UDOT**
Accelerated Weathering	As Specified	C 666	T 260	
Freeze-thaw Test Medium	# 3 % Road Salt			Sealer Studies
Minimum Depth Penetration	$ 5/32 in.			Sealer Studies
Freeze-thaw Weight Loss	# 6 % 300 Cycles			Sealer Studies
Chemical Resistance	Subsections: 1.1.2 1/1/3	C 267		
Friction Number	$ 40	E 274		
Infrared Spectrogram	Materials Division Base Comparison			Materials Studies

* Certified test results from a private accredited testing laboratory will suffice for acceptance.

** Utah Department of Transportation, Materials and Research Division concrete sealer studies of 1986 and 1990.

PART 3 EXECUTION

3.1 PREPARATION

A. Clean concrete surfaces of latence, dirt, dust, grease, oil, and other contaminants using a low pressure hydro-wash, according to the manufacturer's recommendations, without causing undue damage to the concrete surfaces or exposing the course aggregate of the concrete.

B. Allow cleaned surfaces to sufficiently dry after cleaning process before applying sealant (2 hours minimum, or longer according to the manufacturers recommendations, which ever is greater). Apply sealants no later than 3 calendar days after cleaning the concrete surfaces.

C. Supplier of the sealant product must have a technical support person available at the job site within 24 hours of notification for quality control purposes.

D. Place the sealant material only after obtaining the approval from the ENGINEER.

3.2 APPLICATION

A. Application Rate:

1. Based upon the residue content at a coverage rate of 0.012 pounds/ft^2.
2. Apply according to manufacturer's recommendation for each of the following surfaces: Horizontal, Vertical, Overhead.

B. The sealant solution shall not be diluted in any way.

C. Use low pressure airless sprayers or horticulture type spray bars to allow proper application of material.

D. Application Drying Time: Select a sealer with maximum drying time of 1 1/2 hours, and the ability to allow traffic on the treated surfaces within 4 hours of application without tracking or damage to vehicles.

E. Apply sealant only when ambient air and concrete temperatures are above 50 degrees F.

F. Prevent sealant from blowing or tracking onto vehicles. Sealant shall not be applied when blowing winds, inclement weather or other conditions prevent proper application

END OF SECTION

March 24, 2005

SPECIAL PROVISION
SP-9999(750)

SECTION 03611 S

APPROACH SLAB JACKING

(Using a High-Density Polyurethane Method)

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Raising and void filling the approach slab(s) by drilling and injecting expanding high-density polyurethane underneath.

B. Re-support and accurately re-align the approach slab(s) into a stable base and grade for a long lasting smooth ride.

1.2 QUALITY ASSURANCE

Provide Certificates of Compliance for expanding high density polyurethane prior to placement.

1.3 WARRANTY

A. The supplier warrants all materials and workmanship for a period of three years against shrinkage, deterioration or settlement.

B. The supplier replaces by re-injection any material that fails during the warranty period.

1. Submit for the ENGINEER's approval prior to beginning work on project, a Letter of Warrantee against failure of materials and workmanship for a three-year period following completion of the project.

1.4 PAYMENT PROCEDURES

A. Approach slab jacking paid by pound.

PART 2 PRODUCTS

2.1 HIGH DENSITY POLYURETHANE

A. Water based formulation of expanding high density polyurethane high density polyurethane used for raising slabs.
   1. Minimum density of 3.75 lbs/cu. ft.
   2. Maximum density of 4.25 lbs./cu. ft.

B. Sets to 90% compressive strength within 15 minutes after injection, sufficient for traffic, with full strength in 24 hours.

C ASTM D 1621.

PROPERTY	ASTM	LIMITS
Density	D 1622	Min.4 lbs/ft^3
Tensile Strength	D 790*	Min.100 psi
Elongation	N/A	Max. 5.1%
Compressive Strength at Yield Point	D 1621	Min. 90 psi

*Use the value of flexural strength or flexural yield as tensile strength.

2.2 EQUIPMENT

A. Pneumatic drill capable of drilling 5/8 inch diameter holes.

B. Truck mounted pumping unit capable of injecting a high-density polyurethane formulation between the concrete pavement and the sub-base and capable of controlling the rate of rise in the pavement.

C. Truck to be equipped with certified scales or an ENGINEER approved measuring device to monitor amount of material used.

D. A laser level unit for measuring the required grade and elevation.

PART 3 EXECUTION

3.1 PREPARATION

A. Establish a finish target profile of the pavement using a level.

3.2 INSTALLATION

A. Drill holes as required in the roadway slab.

B. Inject material to raise the slab. Pavement must be raised to an even plane.

C. After completion of the slab raising, seal drill holes full depth with the same material.

D. Final grade after jacking must be within ±¼ inch of finished grade profile.

E. The contractor shall be responsible for any pavement blowouts; new cracks or excessive pavement lifting, which may result from the process. The contractor shall repair damaged areas to the satisfaction of the Engineer without additional cost.

March 3, 2005

SPECIAL PROVISION

SP-9999(750)

SECTION 03934S

STRUCTURE POTHOLE PATCHING, QUICK SET

PART 1 GENERAL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Procedures for preparing and installing quick setting concrete patch materials for horizontal surfaces only.

1.2 REFERENCES

A. ASTM C 267: Chemical Resistance of Mortars, Grouts, and Monolithic Surfacing
and Polymer concretes.

B. ASTM C 666(modified): Resistance of Concrete to Rapid Freezing and Thawing.

C. ASTM E 274: Skid Resistance of Paved Surfaces Using a Full-Scale Tire.

D. Utah Department of Transportation's Material Test for Bond and Durability.

E. ASTM C 109: 2" x 2" x 2" Cubes.

1.3 SUBMITTALS

A. Certificate of Compliance to the Engineer.

PART 2 PRODUCTS

2.1 GENERAL

A. The material is packaged and ready for mixing just prior to use in accordance with the manufacturer's instructions.
   1. Concrete gray in color and contains no calcium chloride or admixture containing calcium chloride, or other ingredient in sufficient quantity to cause corrosion to steel reinforcement.
   2. Quick-setting rapid strength gain, non-shrink and high bond strength characteristics are needed.

2.2 FAST SETTING CEMENTITIOUS CONCRETE REPAIR MATERIALS

A. For potholes less than 4 inches in depth, the use of quick-setting materials will be allowed with the prior approval of the Engineer or manufacturer, including quick-setting cementitious concrete, epoxies and urethane material at least 7 days prior to use.

B. Approved patching concrete products from the Performance Data Product Listing (PDPL), available at www.dot.gov/res - J.1. PCC Repair Mtls-Horizontal.

C. REQUIREMENTS

Fast Setting Concrete Repair Materials

*Properties	Requirements	ASTM	AASHTO	**UDOT
Accelerated Weathering	As Specified	C 666(Modified)	T 260	
Accepted Bond Strengths	>1,000 psi @ 24 Hours			UDOT Slant/Shear Bond Test
Test Medium	<3% White Utah Road Salt			UDOT Freeze/Thaw Weight Loss
Accepted Weight Loss	<15% @ 300 Cycles			UDOT Freeze/Thaw Weight Loss
Friction Number	>40	E 274		

* Certified test results from a private AASHTO accredited testing laboratory

will suffice for acceptance.

** Utah Department of Transportation, Research Division, fast setting concrete repair materials studies from 1991 through 1995.

PART 3 EXECUTION

3.1 PREPARATION

A. Traditional Method: Saw Cut & Jackhammer 1" deep.

B. Keep bonding surfaces free from laitence, dirt, dust, paint, grease, oil, rust or any other contaminant other than water.

3.2 INSTALLATION

A. Pre-test the materials under field conditions, at the patch depth anticipated, to determine whether subsequent cracking will occur. The corrective action will be at the discretion of the Engineer.

B. Saturate Surface Dry (SSD) all surfaces receiving fast setting concrete repair materials in accordance with manufacturer's recommendation.

C. Scrub a small amount of fast setting concrete repair material to the walls and bottom of the prepared surface. Apply product, consolidate, strike off and finish repair area. Follow manufacturer's recommendations for product preparation and installation. Repairs shall be within 1/16th inch plus or minus the surrounding pavement.

D. Fast setting concrete repair material must meet a minimum compressive strength of 3,000 psi in 4 hours according to test cylinders taken. One cylinder per batch for the first two days to determine consistency of product, then random cylinders there after.

E. Cure fast setting concrete repair material per manufacturer's recommendation. If the Contractor is adding more than 15 pounds of size No. 8 coarse aggregate per bag of quick setting patch material, the mix design must be in accordance with the requirements of Section 03055.

END OF SECTION